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Pacific
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Management Strategy for Treatment of Lithic Scatter Sites

Studies in Cultural Resource
Management No. 9



James D. Keyser, Thomas L. Burge, and Dorothy M. Fleming, Editors

Management Strategy For The Treatment of Lithic Scatter Sites

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USDA Forest Service

Pacific Northwest Region

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TABLE OF CONTENTS

	PAGE
1.0 INTRODUCTION	1
2.0 BACKGROUND	3
3.0 TARGET OBJECTIVES	3
4.0 SITE DEFINITION	4
5.0 RESEARCH CONCERNS	5
5.1 Introduction	5
5.2 Research Topics and Questions	5
5.2.1 The Relationship Of Prehistoric Human Groups To Their Environment	6
5.2.2 Variability in Hunter - Gatherer Lifeways	7
5.2.3 Technical Studies	7
5.2.4 Crosscutting Studies	8
5.2.4.1 Chronology	9
5.2.4.2 Artifact Studies	9
5.2.4.3 Formation Processes	9
5.2.4.4 Site Function	9
5.2.4.5 Settlement Studies	9
6.0 METHODS AND TECHNIQUES	10
6.1 Introduction	10
6.2 Archaeological Methods	10
6.2.1 Overview	10
6.2.2 Inventory	10
6.2.3 Recordation	10
6.2.4 Surface Collection	10
6.2.5 Test Excavation	11
6.2.6 Data Recovery Plan	11
6.2.7 Excavation	11
6.3 Analysis	11
6.4 Reporting	11
6.5 Curation	11
6.6 Interpretation	12
6.7 Mapping	12
6.8 Data Recording	12
6.9 Surface Collection	12
6.10 Sampling	12
7.0 MANAGEMENT OPTIONS	13
7.1 Introduction	13
7.2 Avoidance	13
7.3 Data Recovery	13
7.4 Allow For Acceptable Levels of Impact	14
7.5 Treatment Of Lithic Scatters Through Project Design	14
7.5.1 Intact Surface Site	14
7.5.2 Disturbed Surface Site	15
7.5.3 Intact Buried Site	15
7.5.4 Disturbed Buried Site	16

Table of Contents (continued)

	PAGE
8.0 IMPLEMENTATION	17
8.1 Professional Staff	17
8.2 Prerequisite Knowledge Levels and Documentation	17
8.2.1 Overview	17
8.2.2 Site Records	18
8.2.3 Inventory Plan	18
8.3 Treatments Appropriate For Lithic Scatter Sites	18
8.3.1 Inventory	18
8.3.2 Probing	18
8.3.3 Data Collection	18
8.3.3.1 Surface Collection	18
8.3.3.2 Site Testing	18
8.3.3.3 Shovel Testing	19
8.3.3.4 Test Excavation	19
8.3.3.5 Data Recovery Excavation	19
8.3.4 Data Recovery Plans	19
8.3.5 Monitoring and Documentation	20
8.3.5.1 Summary Reports	20
8.3.5.2 Regional Office Review	20
8.3.5.3 Integration as Regional Policy	20
8.3.6 Consultation	20
9.0 MONITORING	21
9.1 Project Monitoring	21
9.2 Forest Program Monitoring	21
9.3 Regional Program Monitoring	21
10.0 GLOSSARY	22
11.0 REFERENCES CITED	26
12.0 APPENDIX 1: Research Topics Outline	29
13.0 APPENDIX 2: Office of Personnel Management Qualification Stds	50
14.0 APPENDIX 3: Title 36, Code of Federal Regulations, Part 66	61
15.0 APPENDIX 4: Lithic Scatter PMOA Eligibility Determination Form	64
16.0 APPENDIX 5: Lithic Scatter PMOA	66
17.0 APPENDIX 6: Forest Service Site Form	78
18.0 APPENDIX 7: Draft Update, Forest Service Manual, Chapter 2360, Cultural Resource Management	81

1.0 INTRODUCTION

The area encompassing central and eastern Oregon has long been recognized as a region rich in prehistoric archaeological resources. Consisting of the southern periphery of the Columbia Plateau and the northern portion of the Great Basin, this vast area provided a livelihood for a variety of riverine, lacustrine, and desert-oriented prehistoric cultures over the last 12,000 years. Seven National Forests of the Pacific Northwest Region lie within eastern and central Oregon: the Deschutes, Fremont, Malheur, Ochoco, Umatilla, Wallowa-Whitman, and Winema (Figure 1). Each of these Forests contains a multitude of cultural resource sites that are integrated into Forest multiple resource management programs.

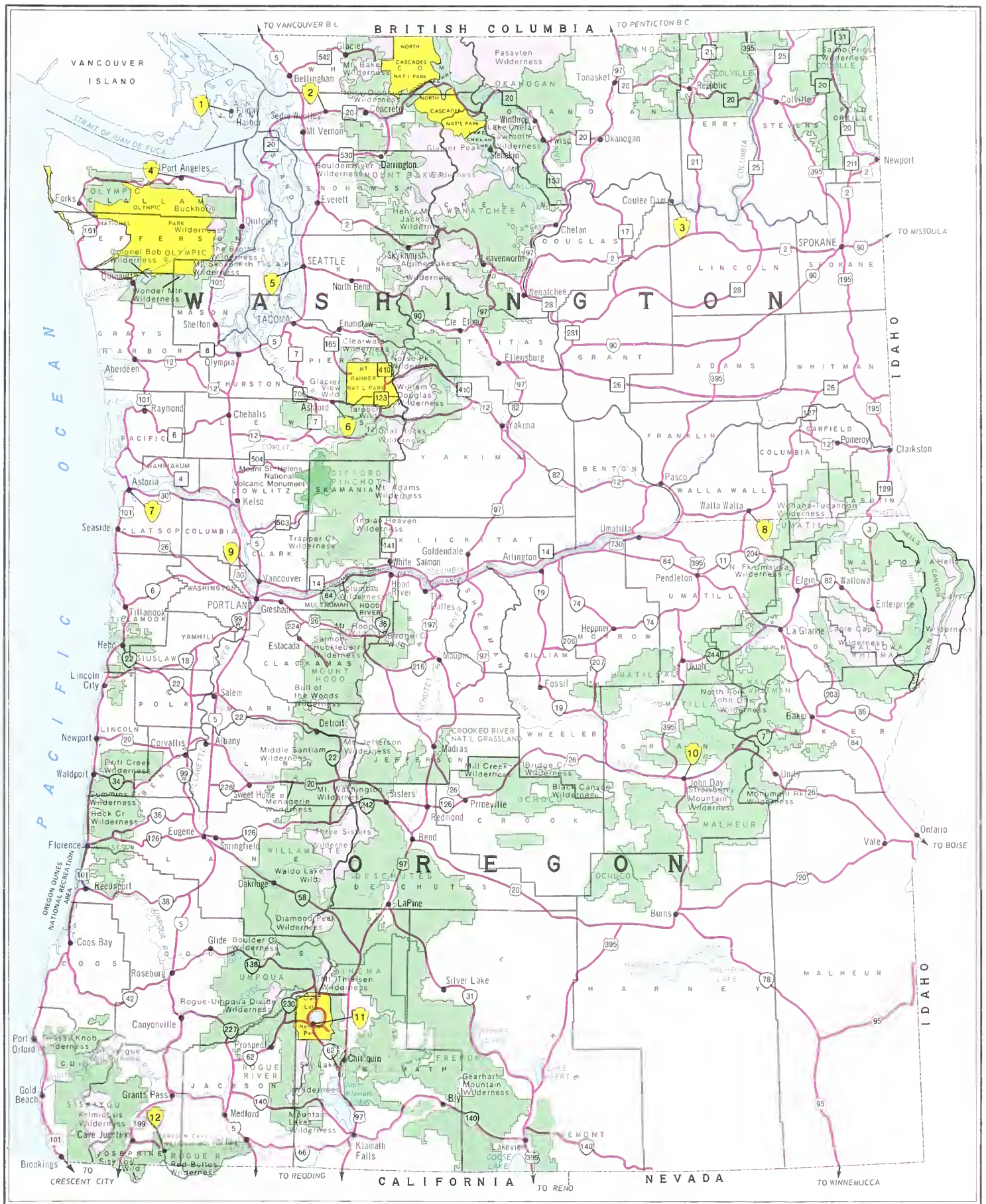
Cultural resources are one of a variety of resource values that are considered in the environmental impact process (c.f., National Environmental Policy Act). As a part of this process, beginning in the early 1970's, the USDA Forest Service initiated a coordinated program of inventory for cultural resources. As the program has grown, records have accumulated on thousands of prehistoric and historical sites. The management alternative used for nearly all of these sites has been "avoidance," with in-place preservation. However, as the number of recorded sites has grown, more situations are occurring where there is conflict between cultural resource values and other resource values.

Within the seven central and eastern Oregon Forests, the most common archaeological sites are lithic scatters; i.e., open-air concentrations composed primarily of chipped stone debris and tools, with occasional bone tools, bone debris, groundstone items, and other artifacts. The site class has been purposefully broadly defined in the present document in order to accommodate the diversity of open occupation sites found in the affected Forests. A series of common site types are excluded including rockshelters, villages, vision quest sites, and human burials. A determination of whether other sites (e.g., a lithic concentration with a possible house pit depression) should be included under the aegis of this management strategy will be made in consultation with the Oregon State Historic Preservation Office (SHPO).

Lithic scatter sites are numerous and often occur in areas where ground-disturbing activities are planned. The environmental factors which made a location desirable in the past are frequently the same factors which make a location desirable today (e.g.,

drainage, view, access to water, etc). As avoidance of these sites is not always practical, it can be more cost-effective to mitigate potential adverse impacts through data recovery.

Given the number and density of lithic scatters and the increasing incidence of resource conflict, a need to streamline the review and compliance process was identified by Pacific Northwest Region cultural resource management (CRM) specialists. Similarly, a need to structure the focus of the potential research associated with lithic scatters was recognized. To these ends, the Forest Service has entered into a Programmatic Memorandum of Agreement (PMOA) with the Oregon State Historic Preservation Office and the Advisory Council on Historic Preservation (ACHP). The PMOA is designed to facilitate the protection, preservation, and management of lithic scatter sites. As part of this streamlined process, the Forest Service has prepared the current management strategy. It is to be used as guidance in managing lithic scatter sites on the affected Forests.



- NATIONAL FOREST
- NATIONAL FOREST WILDERNESS
- MOUNT ST. HELENS
NATIONAL VOLCANIC MONUMENT
- NATIONAL PARK
- NATIONAL PARK SERVICE HEADQUARTERS

NATIONAL FORESTS and NATIONAL PARKS of PACIFIC NORTHWEST

Scale in Miles
0 10 20 30 40 50 60 70 80 90 100

- U.S. HIGHWAY
- INTERSTATE HIGHWAY
- OREGON STATE HIGHWAY
- WASHINGTON STATE HIGHWAY
- COUNTY LINE
- PACIFIC CREST NATIONAL SCENIC TRAIL

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Hood River, Oregon 97031

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Seattle, Washington 98104

National Park Service Headquarters

Map
Location
No.



Coulee Dam National Recreation Area (509) 633-0881
P.O. Box 37
Coulee Dam, Washington 99116



Crater Lake National Park (503) 594-2211
P.O. Box 7, Crater Lake, Oregon 97604



Fort Clatsop National Memorial (503) 861-2471
Route 3, Box 604-FC, Astoria, Oregon 97103



Fort Vancouver National Historic Site (206) 696-7655
Vancouver, Washington 98661



John Day Fossil Beds National Monument
(503) 575-0721
420 W. Main Street
John Day, Oregon 97845



Klondike Gold Rush National Historical Park
(206) 442-7220
117 South Main Street, Seattle, Washington 98104

Map
Location
No.



Mount Rainier National Park (206) 569-2211
Tahoma Woods, Star Route
Ashford, Washington 98304



North Cascades National Park (206) 855-1331
210 S. Highway 20
Sedro Woolley, Washington 98284



Olympic National Park (206) 452-4501
600 East Park Avenue
Port Angeles, Washington 98362



Oregon Caves National Monument (503) 592-2100
19000 Caves Highway, Cave Junction, Oregon 97523



San Juan Island National Historical Park
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2.0 BACKGROUND

Little is known of the archaeology of central and eastern Oregon as it is represented by lithic scatter sites. Only recently has this site class been aggressively investigated (c.f. Fagan 1974, Scott 1982, Pettigrew 1983, Minor and Toepel 1983, Lyman 1983, Pettigrew and Spear 1984, 1986). This research has shown that the information contained within such sites, clearly, has the potential to contribute to our understanding of the prehistory of this region.

In addressing the need to identify and focus the research potential of lithic scatters, an attempt has been made to create an outline which accommodates the varying levels of data which are present at such sites (Appendix 1). In its simplest form, the system has three tiers: Ultimate goals, or complex issues which help get at basic anthropological concerns are at the top (e.g., Human-Environment Relationships, Hunter-Gatherer Adaptations, and Technical Studies); a series of "mid-range connecting topics" make up the middle tier (e.g., studies of settlement patterning, culture change, and cultural ecology); and the lower tier or foundation consists of traditional archaeological techniques (e.g., chronology-building, raw material sourcing, and artifact analyses).

The research topics outlined in Appendix 1 are conceived of as being rather fluid, with the lower-tiered topics frequently cross-cutting one another. Further, these research topics will likely change and evolve as we work with lithic scatters. New topics/questions will be added to the list as they are realized. The use of the overall management strategy for lithic scatters for any given project, then, may allow an investigator to address a variety of research questions with the same data base.

3.0 TARGET OBJECTIVES

The following objectives are central to implementation of the Lithic Scatter PMOA:

1. To ensure that these sites are given treatment commensurate with their archaeological value and the nature and extent of project impacts.
2. To facilitate the treatment (including avoidance and data recovery) of lithic scatter sites that are in danger of impact from land management activities (e.g., timber harvest, road construction, etc.).
3. To ensure that appropriate information concerning the inventory, evaluation, and treatment of these sites is communicated to the SHPO where it will be available to the archaeological profession.
4. To ensure that data recovery (when appropriate) is directed toward current archaeological issues, and results in accumulation of information that advances the knowledge of archaeology in this area of Oregon.
5. To formalize research questions to which data from these sites might be relevant.

4.0 SITE DEFINITION

Lithic scatter sites are open-air concentrations of prehistoric or protohistoric cultural debris that indicate the location of past human behavior. Cultural material at these sites is predominantly chipped stone waste flakes and tools, though some sites include relatively limited quantities of bone scrap, bone tools, groundstone tools, and occasional features such as hearths and housepits. Lithic scatters can be either surface or buried manifestations. Often individual sites show varying densities of cultural material both vertically and horizontally. Vertical density differences in a buried site may indicate variation in the intensity of occupation at the site through time. Horizontal density patterns may indicate activity loci where various tasks were centered, or they may identify multiple occupations on a surface that has remained relatively stable through time. Sites which include complex structural features (e.g., two or more housepits) are not considered lithic scatters for the purpose of this document. Such sites present data recovery opportunities that would require additional consideration and SHPO consultation.

An "isolate" is defined as an artifact which has no surface or subsurface cultural associations. Isolates occur most commonly as single flakes or single chipped stone tools; in some instances multiple specimens occurring in the same area will constitute an isolated find because they have no cultural associations and therefore yield very limited information. Since the identification of an isolate is based on the absence of cultural associations, no number of specimens can automatically be used as a definition. For the purposes of this document an arbitrary figure of 10 specimens (flakes or tools) has been adopted to define a site. A find of fewer than 10 artifacts will be considered an isolate unless justification can be given for defining it as a site. Such justification must be based on a specific research question(s) to which data embodied by the group of flakes or tools would be relevant. Identification of an isolate requires careful surface examination and often some manner of subsurface sampling using auger or shovel probes, small-scale test excavations, or other methods of exposing subsurface deposits.

For the purposes of this PMOA four principal types of lithic scatters are defined:

Intact Surface Site

An intact surface lithic scatter is one in which the physical properties that make up the site are undisturbed by modern human activities.

Disturbed Surface Site

A disturbed surface lithic scatter is one in which the integrity of the site has been altered by historic human activities (e.g., previous logging, vandalism).

Intact Buried Site

An intact buried lithic scatter is one in which the physical properties that make up the site lie in an undisturbed state at least 30 cm below the soil surface.

Disturbed Buried Site

A disturbed buried lithic scatter is one in which the cultural material lying at least 10 cm below the soil surface has been altered by historic human activities.

5.0 RESEARCH CONCERNS

5.1 Introduction

Our present knowledge about the prehistory of the seven National Forests of eastern and central Oregon is limited by a paucity of systematic archaeological investigations. Although thousands of sites have been identified, few have been extensively studied. This is due to the fact that the most frequently adopted management strategy has been to avoid impacting sites, thus leaving them preserved in place. Because newly developing archaeological technology enables the recovery of much more data today than even in the recent past, and future technology is likely to even further improve our ability to recover data and construct models of past cultures, avoidance/in-place preservation will remain the most desirable option for treating most of these lithic scatters. However, the science of archaeology advances very slowly unless excavations are conducted to test hypotheses and models that are proposed to account for culture change, continuity, or process. The Forest Service recognizes that scientific research is a valid use of archaeological sites and supports research efforts by qualified individuals and institutions. When an anticipated impact cannot be avoided by project modification, data recovery is conducted. The following section outlines research questions to which data from lithic scatter sites are relevant (see Appendix 1), outlines the data that will be the focus of recovery efforts, and describes the methodologies used to guide the resulting data recovery projects.

5.2 Research Topics and Questions

In order to manage the sites subsumed by the Lithic Scatter PMOA we must be able to evaluate their information potential and fit them into a larger interpretive and scientific framework. This necessitates explicit problem orientation and careful articulation of relevant research questions in a regional research design. During an initial meeting in January of 1984, archaeologists from Federal and State agencies, academic institutions, and consulting firms developed an outline of relevant research topics (Appendix 1). The resulting document, as noted, begins with three "over-arching" research issues that have broad anthropological relevance. It progresses through mid-level research questions (the usual focus of data recovery projects) to specific data recovery operations to be carried out on individual sites. In this outline, then, specific small-scale concerns are nested within broader mid-level research questions which ul-

timately are synthesized into broad anthropological issues.

While it is worth noting that the research topics identified in Appendix 1 far from exhaust the potential list of topics, they should prove more than adequate in helping to focus lithic scatter research for the foreseeable future. As new research topics are identified they can and will be added to this list.

The three broadest or "over-arching" research topics identified in Appendix 1 are of interest not only to the professional archaeological community, but to the general public as well. They are listed below and discussed in detail in the following subsections. These three topics are:

Topic 1 The Relationship of Prehistoric Human groups to their Environment

Topic 2 Variability in Hunter-Gatherer Lifeways

Topic 3 Technical Studies

5.2.1 The Relationship of Prehistoric Human Groups to Their Environment?

The archaeological record reveals clues to past environments coupled with information concerning how humans adapted to both static and dynamic environmental phenomena. The seven Forests affected by the lithic scatter PMOA embrace a broad diversity of environments characterized by internal drainage basins and playa lakes, a number of major drainages tributary to the Columbia and Klamath Rivers, and numerous intermediate mountain ranges including the east flank of the Cascades. Within this region some environmental phenomena have been relatively stable through the Holocene Epoch, others have been episodic, and still others have undergone dramatic change. It is difficult to generalize concerning paleo-environments across this seven-Forest region, but the topographic diversity evident today provides an excellent opportunity to evaluate the significance of regional trends, as well as to produce an understanding of the complexity of the relationships between humans and their environment. For example, the archaeological record in this region contains data which can explicate both long-term and temporary climatic fluctuations and the effects of these on human adaptations. The record also contains data pertinent to understanding the consequences (often unanticipated) of human behavior on the environment. Such consequences are not new in human history--they can be traced back thousands of years in some areas. Answers to these and other

mid-level research questions may even contribute to informed decision-making concerning ways in which we can interact most effectively with our environment today. Two sample research questions that could be studied using data from these sites are (see outline, Appendix 1, for others):

Question 1 - What have been the patterns of post-Pleistocene changes in the natural and cultural environment?

The archaeological record contains direct evidence both for the nature of past environments and the means by which people adapted to them. In some Forests, bedrock geology and geomorphology have remained relatively stable throughout the Holocene, while on others dramatic volcanic events have changed topography, river courses, and the distribution of floral, faunal, and mineral resources. Other geologic processes are less catastrophic. Alluvial, colluvial, and aeolian processes have gradually altered landscapes through time. The rate at which these processes impact the land is often affected by various climatic factors.

Broad Holocene climatic classification stages have been outlined for western North America (Antevs 1955; Hansen 1947). The **Anathermal** (12,000-7,000 B.P.) was a period of cooler, wetter climate immediately following the retreat of the late Pleistocene glaciers. Key geomorphic features characterizing the Anathermal were large shallow pluvial lakes which covered many of the large basins in southeastern Oregon. Most of these lakes are now extinct, but Klamath, Abert, and Harney/Malheur lakes are remnants of these ancient features.

The Anathermal was followed by the **Altithermal** (7,000-4,000 B.P.) during which conditions became drier and warmer. Lake levels receded and water became a scarce resource. Dune formations characterize this period in some parts of eastern Oregon. The **Medithermal** (4,000 B.P. to present) follows the Altithermal and is thought to be a period of environmental conditions similar to those of the present day. During this time climate gradually ameliorated and floral and faunal resources gradually reached their present distributions.

It should be noted however that this tripartite scheme of environmental change is most useful as a broad characterization. In the decades since its first appearance, additional data have suggested the presence of substantial regional, cyclical variations.

How the large-scale changes identified by Antevs differentially affected local environments is an important focus of specific studies. Some relevant topics include how climatic changes affected the distribution and composition of plant and animal communities. Specific questions might include the nature and timing of change in the altitudinal zonation of plant communities, cause and effect of megafaunal extinctions during both the Pleistocene (e.g., mammoth, camel, horse) and the extirpation of some species during the protohistoric period (e.g., bison, wolf, grizzly bear). Additionally, species distribution of populations of large ungulates (e.g. mule deer, pronghorn, elk, and mountain sheep) were undoubtedly affected by natural and cultural factors as were populations of the smaller mammals (Grayson 1982). Lake desiccation during the Anathermal and Altithermal undoubtedly eliminated habitat for a wide variety of fish and bird species which were of economic importance to prehistoric groups. The effect of this drying has not been well studied in the northern Great Basin and surrounding areas.

Our current portrayal of human adaptation through time is just as simplistic as our understanding of environmental change. The archaeological literature traces the evolution of culture from the Big Game Hunting Tradition, through the Archaic, the Numic Expansion, and finally during the Historic period to the emergence of Euro-American culture. This model relies heavily on lowland cave or deeply stratified sites (see Pettigrew 1979, 1983, 1985), however, and it seems likely that investigations of upland archaeological sites located on Forest lands may give a more representative picture of human adaptation. For instance, we may expect to see clear differences in archaeological site distributions for sites dating from the Anathermal and the Altithermal, since critical subsistence resources would be located at different elevations.

Thus, from these and other questions, it is obvious that study of archaeological sites on the Forested uplands of east-central Oregon is critical to understanding regional prehistory in the context of changing environments. To facilitate the collection of data relevant to these issues, specialized analyses will be employed (where appropriate) to recover paleo-environmental data (palynology, faunal analysis, soil and geomorphological studies, etc.) that can be used to reconstruct past environments. The result will be a more accurate picture of human adaptation in relation to the environment. Additionally, it can be argued that such studies can help us to clarify the paths of environmental change in the future; such develop-

ment would have obvious consequences for land use planning, among other things.

Question 2 - How have humans manipulated the natural environment?

The contemporary natural environment of this region reflects both long-term human use, and drastic short-term environmental changes caused by historic agriculture, grazing, fire prevention, logging and other activities. In Historic times some areas of the region have experienced marked fluctuations of water tables, elimination of native plant and animal species, or drastic increases in other species (e.g., juniper and big sagebrush). Prehistoric residents of the area also had an impact on the environment through their use of critical resources (food, animals and plants, fuelwood, water). For instance, some researchers (Martin and Wright 1967) believe that humans played a pivotal role in the extinction of late Pleistocene fauna. Other research has shown that Indians purposefully used fire to control plant growth and influence animal distribution. Additionally, following Euro-American contact Indians gained access to new technology that gave them even greater power to impact their environment.

Given this background, it is apparent that specific questions such as "How did Indians and early White settlers cause environmental changes?" and "How did such changes affect Indians' use of the area?" can be addressed. The implications of these questions relate directly to many of the environmental issues faced by us today.

5.2.2 Variability In Hunter-Gatherer Lifeways

Archaeology enables investigation of the range of ways hunter-gatherers organize themselves to cope with the demands of their natural environment, and of the ways they interacted with other social groups. These systems were different from our own; they demanded intimate knowledge of the landscape, the distribution of plants, animals, and raw materials, and the cultural practices and movements of other human groups. Knowledge of this variability in human cultural systems lends perspective to today's world and enhances our appreciation of human achievements and human ingenuity.

This research topic provides the opportunity to investigate expectations derived from ethnographic models of hunter-gatherer culture. Because Great Basin groups shared certain aspects of culture, the diversity in their adaptive strategies is just now receiving adequate consideration by archaeologists (Thomas

1973, Bettinger and Baumhoff 1982, Fowler 1982, and Pettigrew 1985). Similarly, models of Columbia Plateau groups are probably over-simplified. Definition of structurally different ecological adaptations requires analysis of the full range of site types located across the physical boundaries of both public and private land. We will begin to approach this long-term goal by addressing research questions like the following through data recovered from sites on National Forest System lands.

Question 1 - To what extent did environmental variation, through time and across space, condition the adaptations of hunter-gatherers in east-central Oregon? To what extent do existing hunter-gatherer models fit the archaeological data? What is the range of adaptive strategies employed by different groups in similar environments or similar groups in different environments? How did changing environmental conditions produce different responses by various social groups?

Question 2 - How did patterns of mobility and sedentism, as well as travel and trade affect the structure of human populations? How did the size of human groups change through time and how did these groups distribute themselves over the area under study? Is there evidence of population decline or movements into or out of the area?

Question 3 - How do archaeological data reflect, elucidate, or differ from our knowledge of hunter-gatherers derived from the ethnographic record? Can material cultural evidence be directly correlated with prehistoric aboriginal technology? Has any ethnographically known social group left a distinguishable "signature" in the archaeological record?

Question 4 - What is the effect of changing technological efficiency on the structure of social systems? Did patterns of human exploitation alter the productivity and distribution of critical subsistence resources, thereby forcing changes in land use and resource scheduling?

Major technological innovations of regional interest include the adoption of the bow and arrow, aboriginal vegetative manipulation through the use of fire, the introduction of the horse, and various fishing and food storage technologies.

5.2.3 Technical Studies

The archaeological record is formed and shaped by natural as well as cultural processes. While natural processes have long been recognized as significant

factors to consider in archaeological reconstruction and interpretation, a detailed literature describing the mechanics and effects of these processes has been slow to develop (c.f. Schiffer 1972; 1983). This pattern is even more applicable to eastern Oregon, especially as it relates to the formation and transformation of the abundant lithic scatter sites in the region. Thus, until topical studies investigating formation processes are undertaken, our understanding of lithic scatter sites will necessarily be limited and very general. Hence, one research approach to prehistoric lithic scatters should include topical studies regarding how such sites are formed and transformed, how they are defined and described by archaeologists, and how they can be appropriately managed. Four major research questions are particularly appropriate.

Question 1 - What will be included in the definition of "lithic scatter"?

The definition, interpretation, and management of lithic scatter sites in eastern and central Oregon has been extremely variable, due largely to a lack of consensus as to what lithic scatters are, how they should be defined, what scientific value they hold, and ultimately, how they should be managed and protected by state and federal land managing agencies (Appendix 1; Topic 3: A-D). Because these issues remain unresolved, there has been a tendency for some archaeologists to ignore these apparently simple sites in favor of more complex, stratified cave and open-air sites. Additionally, a variety of cultural and natural phenomena often complicate the issue (see Questions 2 and 3 below). Topical studies which attempt to accurately depict the nature, range in variation, and scientific value of lithic scatter sites will greatly enhance archaeological knowledge and resource management abilities.

Question 2 - What natural and cultural processes contribute to the formation of lithic scatter sites?

Although there has been a tendency among archaeologists to view prehistoric lithic scatters as a static archaeological phenomenon, a number of natural and cultural processes have formed and transformed the record, often hindering archaeological reconstruction and interpretation (Appendix 1; Topic 3). These include erosion and deposition, pedoturbation, vulcanism and other geomorphic processes. Such processes often shape the distribution of cultural material (either destroying or creating artifact patterning) and affect the artifacts themselves (e.g., causing breakage and obscuring or creating "use

wear"). Natural site formation processes must therefore be fully considered in the interpretation of any lithic scatter site lest they be confused with cultural ones. The cultural processes which contribute to site formation include those of the prehistoric inhabitants themselves (prehistoric discard patterns, activity areas, etc.) and those caused by recent historic activities near or atop the sites. In particular, recent logging is a critical site formation process to consider for lithic scatter sites found on the National Forests of eastern and central Oregon.

Question 3 - What are the cumulative effects of modern activities on lithic scatter sites and how should these be mitigated?

Lithic scatter sites are a diminishing resource in eastern and central Oregon. Nearly 100 years of logging and other ground disturbing activities on eastside Forests has greatly reduced the amount of scientific information that can be gained from some lithic scatters. Thus, another important area of technical studies is assessing the cumulative effects of these activities on lithic scatters by determining the nature and extent of the disturbances. A further consideration involves identifying appropriate levels of mitigation and management (Appendix 1; Topic 3). Topical studies could focus on assessing the number and condition of lithic scatter sites on the seven eastside Forests, what mitigation has occurred and what data have been realized from them, and how to mitigate future impacts (see Philipek 1985).

Question 4 - What are the appropriate measures for protecting and stabilizing lithic scatters?

This last area of administrative study is critical to the lasting protection and management of the lithic scatter resource base (Appendix 1; Topic 3). Currently, little information or direction is available regarding how best to protect and manage lithic scatters. Topical studies could include developing criteria for determining when and where site protection and stabilization is appropriate, how best to implement protection and stabilization, and the development of specific techniques to accomplish these important tasks.

5.2.4 Crosscutting Studies

"Crosscutting" studies are relevant to any or all of the research topics developed for investigating lithic scatter sites in eastern Oregon. Often these form the basic data which to serve as a foundation for studying other research questions. The following subjects are those that crosscut the research issues relevant to lithic scatters; conceptually, they frequently nest

within the broader mid-level research questions and anthropological issues identified in Appendix 1.

5.2.4.1 Chronology

Chronological information is the necessary foundation for virtually all archaeological work. Lack of chronological data prevent satisfactory studies of settlement patterns, paleo-environmental reconstructions, and temporal change in any cultural attributes. More precisely, in order to investigate variability in hunter-gatherer lifeways or relationships of humans to their environment, we must first place archaeological evidence in a temporal context.

For the most part, chronological sequences used to order data in eastern and central Oregon have been borrowed from the adjacent Great Basin and Columbia Plateau culture areas. What is needed is a regional chronology, developed from data collected from sites in this region. Thus, effort will be directed toward establishing local projectile point chronologies from stratified sites with independent chronological data, including radiocarbon dates and strata of known geological age.

5.2.4.2 Artifact Studies

The artifact content of lithic scatters is a primary data base that can be exploited by an expanding body of archaeological techniques. Lithic artifacts can provide chronological information derived from technological and typological analysis and obsidian hydration. Trace element analyses can identify raw material sources and thus enable the study of patterns of human movement and trade. Experimental studies of artifact manufacture and contextual deposition facilitate interpretations of tool use and site formation. In sum, the artifacts that compose lithic scatters are key to understanding these sites. Hence, a primary emphasis in the study of these sites will be artifact analyses.

5.2.4.3 Formation Processes

Study of archaeological formation processes underlie all archaeological interpretations. An archaeological site consists of evidence of human occupation which has been altered by a variety of post-depositional processes, including chemical and mechanical changes in the soil matrix, erosion and deposition, and disturbance by plants, animals, and humans. These post-depositional processes must be understood and accounted for if we are to identify prehistoric cultural patterns.

5.2.4.4 Site Function

Site function is frequently assumed from intuitive and often superficial observations made on both artifactual and environmental data (e.g., the presence of projectile points indicates hunting, adjacent edible plants identify plant processing sites, proximity to water demonstrates campsite use). While these inferences often make some intuitive sense, they may incorporate faulty logic and lead to circular reasoning. For instance, projectile points may be left at a kill site, manufactured at a quarry, or rejuvenated at a campsite. Likewise, it is doubtful that contemporary plant distributions reliably reflect those of prehistoric times.

However, if investigators derive site function from environmental variables, and subsequently assign appropriate functions to the component artifacts, then quite expectedly, the functional interpretations of the artifact assemblage tend to confirm the site function. Obviously then, determination of site function requires cautious analysis of tool assemblages, paleo-environmental variables, and site location, morphology, and community pattern.

When these analyses are completed, a more assured assessment of site function can be made. These analyses can also be used to form a foundation for broader-scale research questions. Formulation and use of such assessments will be one goal of lithic scatter research.

5.2.4.5 Settlement Studies

Past archaeological research has often focused on a narrow range of site types--primarily stratified rock-shelters, pithouse villages, or deeply stratified village site middens. One result of this emphasis is an extreme bias in our understanding of the past. Settlement studies of lithic scatter sites on National Forest lands provide an opportunity to expand the range of site types studied and thereby increase our understanding of prehistoric subsistence and settlement systems. Site locational information is a rich data base, greatly enhanced by analysis of associated landforms, vegetational zones, and soils. Additionally, patterns in site distributional data can help identify the cultural, functional, and temporal affiliations of sites. In summary, identification and description of complete subsistence and settlement systems is necessary to characterize prehistoric adaptive strategies. One focus of lithic scatter research in this area will be the description and interpretation of settlement patterns and subsistence systems.

6.0 METHODS AND TECHNIQUES

6.1 Introduction

The lithic scatters of eastern and central Oregon constitute a data base that remains essentially untapped for scientific investigation. The research questions that have been formulated provide an outline for developing a research orientation for these sites. For many sites, the relevant data will answer only those low level questions concerning lithic technology, settlement pattern, chronology, etc., but synthesis of data from several of these sites should provide answers to the broader questions in this matrix, including the very general topics such as interaction between humans and the environment, and others.

In the Forest Service land management effort, data beyond the level of inventory information will be collected from lithic scatter sites when they are threatened by project impact that cannot be mitigated by avoidance (e.g., project redesign, over-snow logging). In these instances data collection will be structured by a data recovery plan that will address specific research topics which can be addressed with data from the site. The data recovery plan will also relate these site-specific research questions to the broader general topics that will be the subject of synthesis of data from several sites.

When data recovery is the appropriate treatment for a lithic scatter, a multi-disciplinary approach will be used. Individuals with specific expertise in data recovery and/or analytic techniques will be employed. Although each lithic scatter site is unique to some degree, basic archaeological methods and techniques will be used to recover and analyze data. These are described below.

6.2 Archaeological Methods

6.2.1 Overview

An overview is a general description of the culture history, cultural ecology, and cultural processes which characterize a particular area. Currently those available in Oregon are primarily oriented toward specific National Forests, though a State-wide overview has recently been completed for Oregon (Aikens 1984). In most cases, overviews will not describe or discuss specific lithic scatters, but these documents will be periodically updated with appropriate data from investigations of lithic scatter sites.

6.2.2 Inventory

This is the process of locating cultural resource sites. It is a comprehensive field survey of a specific area designed to locate all visible cultural resources. It results in a written report which includes recording, mapping, and photographing of cultural resources. In the Forest Service, inventory is usually project specific in response to a planned undertaking. Inventory should be done according to guidelines established in an inventory plan (see Keyser 1983).

6.2.3 Recordation

The process of documenting the significant attributes of a cultural resource site and its surrounding environment is recordation. Lithic scatters will be recorded on Forest Service site forms (Appendix 6). In some cases all significant information concerning a lithic scatter site can be recorded by completing a Forest Service site form, supplemented by an appropriate surface collection of artifacts. When a professional archaeologist determines that this is the case, the site data will be collected/recorded and the SHPO will be notified that the completed site form and artifact sample constitute appropriate data recovery. An emphasis should be placed on recognizing any chronological associations for these data, if they are present.

6.2.4 Surface Collection.

This is the controlled collection of materials exposed on a site. It should be done for two reasons (1) to collect representative samples of data for determining a site's specific research potential, or (2) as data recovery on sites with no buried cultural material. Surface collection may be controlled by mapping and point-plotting techniques, depending upon the needs of the appropriate research questions. When undertaken as data recovery, surface collection must be in accord with an approved data recovery plan.

For small surface sites whose only value is the distribution, technology, and source of the lithics, data recording on the site form, coupled with point-plotted surface collection of the materials, can serve as data recovery. The decision to employ this option will be based on the needs of the research topics identified as appropriate for a given site. If, in the opinion of the Forest Archaeologist, this can be accomplished during the inventory phase it will be completed at that stage. A report describing the recovery and analysis

of the materials will be provided to the SHPO for all such sites.

6.2.5 Test Excavation

Testing of lithic scatters is intended to provide data to determine depth, horizontal extent, and material content. Testing is either done as shovel probing, or excavation of formal test pits. Shovel probing represents informal data gathering to determine the presence of buried materials and to suggest their subsurface distribution. Formal test excavation is used to ascertain quantity and quality of buried materials. All relevant data from either type of testing effort must be recorded to professional standards. Formal test excavation is often used to collect information on which a data recovery plan is based. It is also used as the initial phase of data recovery in order to ascertain where larger excavation units should be placed to maximize information gathering.

6.2.6 Data Recovery Plan

A data recovery plan is the research design used to organize collection of data from a site. The data recovery plan must be responsive to the need to recover from the site a usable sample of data on all relevant research problems. If this is not feasible, a clear and defensible rationale for collecting data on a smaller range of problems at the expense of others must be presented (See Appendix 3; 36 CFR Part 66.2.a).

6.2.7 Excavation

Excavation is a primary method of collecting archaeological data. It involves the controlled removal and recording of cultural material and associated environmental data from a site context. Many methods of excavation are available and may be used singly, or in combination on the same site. Data recovery excavation of lithic scatters will be done in accord with the guidelines in the Handbook for the Treatment of Archaeological Properties (ACHP 1980). The focus of this work will be structured by those research topics deemed appropriate from Appendix 1. The excavation will be guided by a data recovery plan prepared by, or under the guidance of, the Forest Archaeologist and reviewed by the State Historic Preservation Office. All standard archaeological field methods used for excavation (e.g., mapping, provenience control, photography, recording, etc.) will be used as appropriate. A report will be prepared that summarizes the data recovered from every site excavation conducted as part of this PMOA.

6.3 Analysis

Analysis is the means by which data are studied and related to other information. Analytical techniques include means of studying all archaeological and related environmental data. Traditional techniques will be used on data from these sites. In addition to basic analysis, which focuses on the description of data and their characteristic attributes, comparative analysis will be a goal of investigation conducted under this PMOA. Comparative analysis and synthesis of the results strive to place data in a regional perspective by comparing them to data recovered from other sites. In this way inter-site comparisons and contrasts are achieved and research questions with a regional focus can be addressed. All reports done for lithic scatter sites under this PMOA will involve comparative analysis and synthesis of the recovered data.

6.4 Reporting

Data recovery is not complete (and the significance of the data contained in these sites is not realized) until an interpretive report describing the project and discussing the methodology used, research questions addressed, results obtained, and conclusions reached has been prepared. It should also include and analysis of expected results versus real results. The final report shall contain the reason(s) for the proposed project, a thorough description of the methods employed during the fieldwork as well as the analyses, a representation of the recovered data, and the author's observations and conclusions. The data recovery plan will also be reproduced in the final report. The report shall meet current professional standards. It will be made available to the professional community. Appropriately edited versions will be made available to the interested public.

Given the importance of a final report, all data recovery projects (including collection of surface sites when done as data recovery, see Surface Collection section, above) will be documented by a professionally acceptable report.

6.5 Curation

Curation is the storage and care of materials recovered from an archaeological site. Care will be taken to ensure that all recovered materials are stored and cared for in an appropriate manner. Use of designated museums and academic institutions will be required for all specimens other than those used in current interpretive displays.

6.6 Interpretation

Communication of the data inherent in lithic scatter sites to other professionals, as well as lay people, is a key element in the full realization of the value of these sites. Professional interpretation occurs most often in reports that address and attempt to answer research questions. Interpretation for the general public usually occurs in the context of displays, brochures, or other generalized communications that disseminate information from archaeological sites. Professional interpretation will occur as part of the reports required for data recovery projects and during the updating of overviews when new data are summarized and synthesized. Public interpretation will be pursued in situations when relevant factors (e.g., nature of data, visitor use, etc.) warrant such efforts.

Various techniques are available to ensure that pertinent information is recovered from lithic scatter sites. These techniques include:

6.7 Mapping

Mapping of lithic scatter sites occurs during several different stages of the investigations. During inventory and recording of a site, the field investigator makes a sketch map showing site features. During a controlled surface collection a map is made to provide a reference point for all collected items. In test excavation or data recovery projects a site map is made to serve as a base for recording the relative positions of excavation units, major features, and other items of interest. All maps are oriented to a datum--a permanent feature of the site that can be relocated on the ground. All maps become a part of the permanent record of a site.

6.8 Data Recording

Data are recorded in all phases of investigation of a lithic scatter, from inventory through data recovery. The basic means of data recording is to complete a site form which documents all relevant attributes of the site and the surrounding environment. For most sites the site form is merely a short summary of their data potential, but for some small surface lithic scatters a completed site form (coupled with a surface collection of a sample of the material) is sufficient to achieve data recovery. Any such site shall be carefully evaluated by the Forest Archaeologist and a report will be prepared for each, summarizing the data recovered from it. These reports will be provided to the SHPO.

The drainage basin orientation used by the SHPO will be adopted when recording lithic scatter sites. This technique will facilitate the inter-drainage comparison of site data.

Data recording also occurs during the test excavation and data recovery phases of investigating a site. Standard archaeological data recording techniques will be used. These include written description, illustration, and photography.

6.9 Surface Collection

Depending on the research question addressed, surface collection of specimens can have different orientations (e.g., some collections attempt to recover all types of specimens from a given area of the site; others are focused on recovering all individual specimens of a certain type of artifact from the entire site). The appropriate type of site map will be made for surface collected lithic scatter sites. Point plotted surface collection is a valid recovery technique that requires careful documentation of the locations of specimens that are collected.

6.10 Sampling

Sampling systems are used to expedite collection and analysis of data from lithic scatter sites. The purpose of the technique is to reduce a large body of data to a size that will be manageable for collection, curation, and/or analytic purposes. There are numerous appropriate sampling schemes for all types of collection and analysis processes. Specific schemes to fit the task will be selected by the Forest Archaeologist (or contractor, in consultation with the Forest Archaeologist) and clearly described in the Data Recovery Plan and the report for the project.

7.0 MANAGEMENT OPTIONS

7.1 Introduction

A wide variety of ground-disturbing projects occur annually on every eastside Forest in Region 6. These projects range from small recreation developments to road construction to large-scale timber harvesting (Table I). Each activity produces some degree of ground-disturbance which can potentially affect prehistoric lithic scatter sites. The scale of these projects does not necessarily correlate with the extent of site damage that can potentially occur. For example, the piling, crushing, and burning of tree limbs ("slash") in a timber harvest unit can cause greater ground disturbance than actual timber felling.

Likewise, small projects may cause more cumulative damage to lithic scatter sites than a timber sale inasmuch as these projects may require excavation, often in areas of extreme cultural resource sensitivity. Thus, the project emphasis of this PMOA is on a wide range of Forest Service activities.

Regardless of the nature of the project, four basic management options are available for lithic scatter sites located within the boundaries of any ground-disturbing project. These include:

7.2 Avoidance

The potential adverse impacts to lithic scatter sites caused by ground disturbing projects can be mitigated through site avoidance. This will be based

on a recommendation by the Forest Archaeologist and agreed to by the Line Officer. The archaeologist, will identify site boundaries and, where needed due to the activity, allow for an appropriate buffer zone to prevent inadvertent impact to a site. Avoidance is an important management option, although it may not always be the most economical. The relative cost, in time, dollars, and management goals, between avoidance and mitigation (data recovery) will be analyzed on a case-by-case basis.

Avoidance is particularly appropriate when the lithic scatter site is too complex or scientifically valuable to be treated through other PMOA options or when time or funds are not available to undertake an adequate data recovery program.

7.3 Data Recovery

The potential adverse impacts to lithic scatter sites can be mitigated through a formal data recovery program which will remove a sample of site data prior to project implementation. The data recovery plan will be formulated by the Forest Archaeologist in consultation with the SHPO. Data recovery will follow the procedures outlined in Title 36 Code of Federal Regulations, Part 800; the Forest Service Manual (FSM), Chapter 2360; and the Advisory Council on Historic Preservation's Handbook for the Treatment of Archaeological Properties (1980). Protecting some portion(s) of a site will always be considered.

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**Table I. Examples of Ground Disturbing Activities
on National Forest Lands***

Logging	Management Fuels	Silviculture	Construction
Felling	Piling	Thinning	Roads
Yarding	Lopping	Planting	Quarries
Tractor	Crushing	Site Preparation	Water Developments
Cable	Burning	(Disking)	Pipelines
Skyline	Scattering	(Burning)	Springs
Helicopter		Seed Orchards	Recreation
Loading			Trails
			Campgrounds
			Buildings

* This list is not exhaustive; other small and large projects occur each year on Forest land to facilitate multiple resource management.

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Data recovery is appropriate when in-place preservation is not a viable management option and sufficient funds have been committed to undertake the appropriate level of data recovery.

7.4 Allow for Acceptable Levels of Impact

In some cases, projects may affect such a small portion of a site that site avoidance or data recovery are neither necessary nor warranted. This option is appropriate when the proposed impact will minimally affect the qualities which contribute to the scientific value or significance of the site. For example, a large (several acres) lithic scatter site next to a quarry may contain abundant archaeological data (e.g., flaking debris which documents use of the quarried material). If a proposed haul road through a corner of the site would disturb archaeological materials that are protected elsewhere on the site, mitigation might not be appropriate. If such a determination were made by a professional archaeologist in consultation with the SHPO, the haul road construction would fall within an acceptable level of impact.

In another instance, a lithic scatter may lie in an area that has been previously harvested for timber. The site has been so badly disturbed that contextual or spatial information is absent or severely compromised; the site's primary value lies in the information that may be realized from a lithic analysis of the stone tools and debitage themselves. Thus, a proposed timber project, such as precommercial thinning, may not require mitigation since the damage has already occurred and data (stone tools and debitage) will always be present on the site.

This option requires consultation between the Forest Archaeologist and the SHPO, and will be based on a case-by-case consideration:

- a. The site's scientific value (as reflected in the ability of the data to address relevant research topics)
- b. The site's physical characteristics (horizontal/vertical boundaries)
- c. The site's integrity and condition
- d. Past and expected (cumulative) impacts on the site and in the area
- e. Management opportunities for total avoidance and/ or data recovery

7.5 Treatment of Lithic Scatters Through Project Design

The remainder of this section details project designs that are appropriate to avoid impacting lithic scatter sites while continuing the primary project. Typically, these involve designing a timber sale, burning prescription, etc., using conditions that will not impact the values of the site. Based on our experience with various design criteria we offer the following options, arranged by category of site, are offered:

7.5.1 Intact Surface Site

These sites have high information content and are comparatively scarce. Therefore, project design criteria are limited to the following options, or any combination thereof:

Logging

- a. Logging the site over snow when there are appropriate ground conditions to protect the site; i.e., at least 20 inches of snow and overnight temperatures of less than 25 degrees (F.) and afternoon temperatures less than 35 degrees (F.), using existing skid trails, and employing cultural resource monitors on the site.
- b. Directional felling of designated trees that are inside the site boundaries to limit impact.
- c. Directional felling (towards the site's outer boundaries) of designated trees that are located on the periphery of the site.
- d. Aerial logging with full suspension of the logs.
- e. Skyline logging with full suspension of the logs.

In all cases, heavy equipment will be kept outside the site boundaries. Such logging techniques as ground yarding, cable yarding, skyline yarding with one end suspension, and directional felling with use of skid trails inside the boundaries of the site are **not** appropriate for intact surface sites.

Fuels Treatment

- a. Hand piling of slash in off-site location.
- b. Broadcast burning at low temperatures.
- c. "Lopping and scattering" of slash rather than burning it.

In all cases, heavy equipment will be kept outside of the site boundaries. Slash treatment and fire line con-

struction will take place outside the site boundaries. Low temperature broadcast burning is not viewed as an adverse impact to the lithic resources composing these sites.

Silvicultural Treatment

- a. Tree planting by hand, augering or mechanical equipment, mechanical site preparation, and rodent control will not be undertaken within the boundaries of intact surface sites. When silvicultural treatment is necessary within site boundaries, mitigation will be undertaken.
- b. Commercial timber thinning over snow when there is appropriate snow depth and conditions (frozen ground) is an appropriate option (c.f. Philipek 1983).
- c. Noncommercial thinning by hand and chainsaw is appropriate.

Construction (e.g., roads)

- a. Construction projects within the boundaries of intact surface lithic scatter sites will be undertaken only after appropriate mitigation measures have been completed.

7.5.2 Disturbed Surface Site

The management options for sites which have been disturbed are less restrictive than for Intact Surface Sites, but still require sensitive treatment for most classes of impacts.

Logging

- a. Logging over snow when there is appropriate snow depth and ground conditions to protect the site. (See 7.5.1. above).
- b. Directional felling of designated trees that are inside the site boundaries.
- c. Directional felling (toward the site's outer boundaries) of designated trees that are located on the periphery of the site.

Based on the degree of surface disturbance, the following logging systems may be employed following consultation with the SHPO. System designs will consider the existing degree of disturbance (depth and location).

- d. Skyline yarding with one end suspension.
- e. Ground yarding.

- f. Cable yarding.
- g. Designated skid trails.
- h. Constrained yarding based on soil moisture content.
- i. Horse logging.

Fuels Treatment

Hand piling, lopping and scattering of slash without burning, or low temperature broadcast burning are the only appropriate methods of fuels treatment for this class of sites.

In all cases, heavy equipment will be kept outside the site boundaries. Piling and burning of slash will also take place outside of the site boundaries.

Silvicultural Treatment

- a. Tree planting by hand or augering may take place within the boundaries of a disturbed surface site. Mechanical equipment will not be allowed. If more extensive silvicultural treatment is necessary, mitigation measures will be developed.
- b. Commercial timber thinning when appropriate snow depth and conditions (frozen ground) are present to protect the site (Philipek 1983).
- c. Precommercial thinning by hand and chainsaw is appropriate.

Construction

- a. Construction projects within the boundaries of a disturbed surface lithic scatter require appropriate mitigation measures.

7.5.3 Intact Buried Site

Similar to Intact Surface Sites, Intact Buried Sites require very sensitive treatment in regard to expected impacts and mitigation.

Logging

- a. Logging over snow when the snow and ground conditions are adequate to protect the site (see 7.5.1 above).
- b. Directional felling of designated trees that are inside the site boundaries to limit impact.
- c. Directional felling (toward the site's outer boundaries) of designated trees that are

located on the periphery of the site.

- d. Aerial logging with full suspension of the logs.
- e. Skyline logging with full suspension of the logs.

Ground yarding, cable yarding, skyline yarding with one end suspension, directional felling, and use of designated skid trails are appropriate when the logging system is designed to not affect the cultural deposit. This can occur when disturbance is limited to the noncultural deposit above the buried cultural deposit(s). The type of logging system will depend on the depth of the site's buried cultural deposit(s).

Fuels Treatment

- a. Hand piling of slash is the most appropriate method for treating slash inside site boundaries but wheeled and tracked equipment can be used under the following conditions:

When snow is of an appropriate depth and ground conditions are adequate to protect the site.

When the site's cultural deposits lie beneath the impact zone.

- b. Broadcast burning at low temperature and "lop and scatter" treatments are appropriate.
- c. Piling and burning of slash will take place outside site boundaries.

Silvicultural Treatment

- a. Tree planting by hand, augering, or mechanical equipment and site preparation using mechanical equipment will not be undertaken within site boundaries unless:

The excavation associated with planting and site preparation does not penetrate to the buried cultural deposit(s), or

The excavation associated with planting and site preparation takes place in areas peripheral to the cultural deposit(s), or

Hand tree planting with bar or hoe at 12-feet-by-12-feet, or greater, spacing is used.

- b. Commercial timber thinning is appropriate within site boundaries when snow is of appropriate depth and ground conditions are adequate to protect the site.
- c. Precommercial thinning by hand and chainsaw

is appropriate.

Construction

- a. Construction projects within the boundaries of an intact subsurface lithic scatter site require appropriate mitigation measures.

7.5.4 Disturbed Buried Site

The management options for this class of site are less restrictive than for Intact Buried Sites and emphasize protection of remaining cultural deposit(s).

Logging

- a. Logging over snow when there is appropriate snow and ground conditions to protect the site.
- b. Directional felling of designated trees that are inside the site boundaries.
- c. Directional felling (towards the site's outer boundaries) of designated trees that are located on the periphery of the site.

Ground yarding, cable yarding, skyline yarding with one end suspension, directional felling, and use of designated skid trails are appropriate when the logging system is designed to not affect the cultural deposit(s). The type of logging system will depend on the depth of the site's buried cultural deposit(s).

Fuels Treatment

- a. Hand piling and burning of slash is preferred within site boundaries. Mechanical equipment can be used under the following conditions:

When snow atop the site is of appropriate depth and ground conditions are adequate to protect the site.

When the site's cultural deposit(s) lie beneath the impact zone.

Silvicultural Treatment

- a. Tree planting by hand, augering, or mechanical equipment and site preparation using mechanical equipment will not be undertaken within site boundaries unless:

The excavation associated with planting and site preparation does not penetrate to the buried cultural deposit(s), or

The excavation associated with planting and site preparation takes place in areas peripheral to the cultural deposit(s), or

Hand tree planting with bar or hoe at 12-feet-by-12-feet, or greater, spacing is used.

- b. Commercial timber thinning is appropriate within site boundaries when snow is of appropriate depth and ground conditions are adequate to protect the site.
- c. Precommercial thinning by hand and chainsaw is appropriate.

Construction

- a. Construction projects within the boundaries of disturbed buried lithic scatter sites require appropriate mitigation measures.

8.0 IMPLEMENTATION

There are three qualifying conditions required for a participating Forest to use the lithic scatter PMOA.

8.1 Professional Staff

Qualifying Forests will have a professional archaeologist who meets the OPM X118 qualification standards (see Appendix 2). All inventory, data collection, and site evaluation work must be accomplished to professional standards certified by the Forest Archaeologist. Technician level personnel can assist with inventory and data collection under the direct supervision of the Forest Archaeologist.

To administer or conduct data recovery efforts a professional archaeologist must meet the qualifications listed in 36 CFR 66 (see Appendix 3) in addition to OPM X118 standards.

Other cultural resource personnel are the Cultural Resource Technician (CR Tech) and the Archaeological Technician GS-102. The CR Tech must meet Forest Service Manual standards (see Appendix 7). CR Tech's perform survey and assist with data collection under direct professional supervision. The Archaeological Technician must meet OPM X118 standards. The work performed by these technicians will vary by their qualifications and experience. Typically these people are archaeology/anthropology students employed seasonally by the Agency. They conduct survey and data recovery and supervise CR Technicians, if they meet 36 CFR 66 qualifications. Their work is reviewed by the Forest Archaeologist.

8.2 Prerequisite Knowledge Levels and Documentation

8.2.1 Overview

Each participating Forest must have completed an Overview of the known archaeological record of the Forest.

8.2.2 Site Records

Each participating Forest must maintain files for all recorded archaeological sites. The file format may vary, but these files must be organized to facilitate access to all previously recorded site data. They must be cross-referenced to the Oregon SHPO site files and the corresponding Smithsonian site numbers. All sites should be recorded on a map atlas system to allow for rapid consultation between the various personnel responsible for surface management activities.

8.2.3 Inventory Plan

Each participating Forest must have a written Inventory Plan that has been formally approved by the SHPO. The Inventory Plan describes the rationale employed for inventory strategies on a participating Forest. The plan should be based on the data synthesized in the Overview and incorporate the current knowledge of the Forest cultural resource base. Each inventory plan should demonstrate an integrated approach including a Regional research design addressing significant issues of archaeological importance as reflected in the appropriate research topics of Appendix 1. These plans should be prepared considering the Department of the Interior manual "The Archaeological Survey: Methods and Uses" (King 1978).

8.3 Treatments Appropriate for Lithic Scatter Sites

Various treatments are used to identify the value of lithic scatter sites, these include:

8.3.1 Inventory

Initial identification and recordation of a lithic scatter site is made during the field inventory stage. An Overview does not necessarily identify sites in sufficient detail to classify all lithic scatters (as defined in this document).

Data recordation during the inventory stage must include sufficient information to fully describe the site and determine its eligibility status within the boundaries of the Lithic Scatter PMOA. Collected data should be consistent with the standards of the archaeological profession. Typically, a completed Forest Service Cultural Resource Site Inventory form will meet this goal.

The data recordation should include an estimate of the:

- a. Horizontal and vertical stratigraphy.
- b. Artifact distribution and density.
- c. The site's potential to answer research questions defined in the PMOA.
- d. Chronology/dating.
- e. Cultural affiliation.

8.3.2 Probing

Under the terms and conditions of the Lithic Scatter PMOA, those sites which meet the basic definition of a lithic scatter site (see definition, above) are considered eligible for inclusion in the National Register of Historic Places. However, site specific probing may be required to verify site integrity, research potential, etc.

8.3.3 Data Collection

Data will be collected from the following types of archaeological manifestations as described below.

Isolates - collect specimens if data needed to meet research objectives.

Surface sites - ascertain status by subsurface probing. Data collection may involve point-proveniencing of selected loci to collect lithic technological data.

Subsurface sites - ascertain status by shovel testing. Once the presence of subsurface material is documented, any further work should be at the test excavation level using formal archaeological excavation procedures and a research design appropriate for the site. All test excavation work should be directed toward data collection which may eventually be used for the mitigation of impact to the site.

The following methods of data collection will be used to accomplish the goals of the Lithic Scatter PMOA:

8.3.3.1 Surface Collection

On some sites, data collection can be accomplished by surface collection of artifacts rather than excavation. As in excavation, this method of data collection to mitigate impacts will be conducted according to a data recovery plan completed in consultation with the Oregon SHPO.

8.3.3.2 Site Testing

Before preparing a data recovery plan to guide mitigation work, some initial site testing is often required. This may be in the form of shovel testing or more structured formal test excavation. Shovel testing or test excavation may only be done by a professional archaeologist or an archaeological technician under the direct supervision of a professional archaeologist. When appropriate, formal test excavation should be done as a phase of the data recovery plan. All test pits must be put on the site maps.

8.3.3.3 Shovel Testing

Shovel testing is defined as a two-shovel-wide (No. 1 shovel), round hole dug to determine if there are sub-surface cultural materials present. All dirt removed is screened through a 1/4-inch mesh screen. All artifacts found are collected and labelled. The hole must be dug to either bedrock or a minimum of 50 cm below ground surface. Whereever possible, profiles should be drawn. All test pits must be put on the site maps.

Shovel Testing Guidelines

- a. Shovel testing may be done by a professional archaeologist or an archaeological technician. Qualified Cultural Resource Technicians may assist with shovel testing when supervised by a Professional Archaeologist.
- b. Shovel testing should only be done to ascertain if there is buried cultural material at a site threatened with impact.
- c. All test holes must be mapped and measured using a tape and a permanent site datum.
- d. The decision to shovel test should be made in the field based upon the field conditions and the anticipated project impacts. If the potential impacts to the site cannot be anticipated and the site is remote from roads, a shovel test should be conducted to avoid a return trip.
- e. Data obtained in shovel testing must conform to standard archaeological recording procedures including (but not necessarily limited to) location of pits, size and depth of excavation, soil strata observed, depth of culture-bearing strata, and vertical and horizontal provenience of cultural materials. Observations of the potential for the presence of paleo-ecological or datable material should be made. The total volume of excavated fill should also be recorded and an estimate of the percentage of the site tested should be made.
- f. In the event a cultural feature is encountered (e.g., a hearth, cache of artifacts, stone alignment, or house pit), shovel testing work must cease at that locus. Consultation with the Forest Archaeologist is required at this point. The collection of suitable material for radiometric dating may be appropriate.
- g. All shovel test holes must be back-filled and left with the surface conforming as close as possible to the original topography.

- h. In most cases, shovel test excavations will precede more extensive test excavations in an attempt to eliminate the need for formal test excavation.

8.3.3.4 Test Excavation

A test excavation is a planned, formal examination of a site. Field methods include establishing a site datum and site grid before excavation begins. A site contour map must also be prepared. The collection of the data necessary to prepare this map may be undertaken before, during, or after the test excavation. Test excavations are used to obtain information for structuring full-scale data recovery efforts. A test excavation should only be initiated by the Forest Archaeologist for the purposes of preparing a site excavation plan. Test Excavation must be supervised by a qualified archaeologist. It can be conducted in-service, or under contract. Cultural Resource Technicians or volunteers can assist with test excavations under professional supervision.

8.3.3.5 Data Recovery Excavation

This level of excavation is usually performed by a Forest Cultural Resource Specialist or a CRM Consultant (FSM 2361.29a(2)). The specific goals of the excavation will be determined in advance of excavation but after consultation with the Oregon SHPO. The role of the Cultural Resource Technician is limited to support and liaison for projects on his/her District. In all cases, every attempt will be made to involve the technicians in Forest projects to broaden their experience and interests. Archaeological Technicians who have the qualifications of a professional Archaeologist (Appendix 3) may be authorized by the Forest Supervisor to do data recovery excavation on a case-by-case basis (FSM 2361.29a).

8.3.4 Data Recovery Plans

Data recovery plans are formal agreements made with the SHPO in fulfillment of Federal requirements for site protection. Formal test excavation should be incorporated as a phase of the data recovery plan. The plan should allow for phased work and provide a mechanism for implementation of changes in emphasis should the scientific expectation of a site change during the excavation phases.

In addition to meeting the consultation requirements of the Oregon SHPO, the plan should be prepared in accordance with the handbook "The Treatment of Archaeological Properties (ACHP 1980).

The data recovery plan should contain (at minimum) the following sections:

- a. Identification of the relevant research topics from Appendix 1 (including explication of how data from the site(s) will be used to address the research questions.
- b. Excavation (or Surface Collection) Methodology
- c. Data Recording Methodology
- d. Analyses to be Conducted
- e. Report Specifications
- f. Qualifications of Personnel who will Conduct Work

8.3.5 Monitoring and Documentation

The purpose of this section is to ensure that the PMOA functions as intended, and to provide a mechanism to identify needed change.

8.3.5.1 Summary Reports

Each Forest will prepare an annual report listing the number of lithic scatter sites recorded, the number found eligible for the National Register, and the number treated as part of a Forest undertaking. This report will be submitted to the Regional Office by January 15 of each succeeding year. The Regional Office will prepare an annual summary report from the Forests' data for submission to the SHPO by April 1 of each succeeding year.

Individual archaeologists will provide written summary results of their work on these lithic scatter sites to the SHPO's office. Presentations at professional meetings are also encouraged, as well as, publications through professional outlets.

8.3.5.2 Regional Office Review

As part of the normal process of program reviews and monitoring trips, the Regional Office cultural resource staff will review selected Forests to insure a uniform treatment of lithic scatter archaeological sites.

8.3.5.3 Integration as Regional Policy

The completed Lithic Scatter PMOA and reference to the Management Strategy will be included in the Forest Service Manual and Handbook as Pacific Northwest Regional supplements.

8.3.6 Consultation

1. Consultation with the Oregon SHPO should follow the normal process as directed by the FSM and Regional policy. Inventory reports containing a description of one or more lithic scatter sites will include the Oregon SHPO lithic scatter site eligibility form (Appendix 4). All lithic scatter sites eligible for the National Register of Historic Places will be listed on the form for SHPO information. The SHPO will keep a computerized list which includes data on Districts and Forests. Determinations of eligibility may be requested by the SHPO.

2. Test excavation of lithic scatter sites will be limited to collecting data needed for site description and planning of mitigation. All site testing projects will be documented by a professionally acceptable final report describing results of the work.

3. Data recovery excavation of lithic scatters will be undertaken in accordance with a completed data recovery plan prepared in consultation with the Oregon SHPO.

9.0 MONITORING

Monitoring of the activities under this Programmatic Memorandum of Agreement will take place on three levels. These include project monitoring, Forest program monitoring, and Regional monitoring.

9.1 Project Monitoring

Sites treated under this PMOA will be monitored to analyze the effectiveness of mitigation measures on a project-by-project basis.

No fewer than 10 percent of the lithic sites that are mitigated by avoidance will be monitored to determine the effectiveness of the avoidance activity and for the specific site.

All sites protected by project design or redesign will be monitored to assess impacts and analyze the effectiveness of the project design in reducing or eliminating adverse impacts to the site. This analysis will be documented and made available to the State Historic Preservation Office.

All sites from which data are recovered will be monitored by the Forest Cultural Resource Specialist to determine the effectiveness of the data recovery effort in documenting the significant data contained in the site and to analyze the applicability and success of the data recovery plan. This analysis will be documented if the data recovery plan requires modification. Monitoring of work done under contract will be conducted according to inspection specifications set out in the contract.

Monitoring may consist of: field inspections of sites during and/or after mitigation activities have commenced or are completed, the inspection of a Contracting Officer's Representative, or through post-timber sale Environmental Analysis reviews.

9.2 Forest Program Monitoring

Each Forest will prepare a report listing the number of lithic scatter sites recorded, the number of sites found eligible or ineligible for the National Register, and the number of sites treated as part of a Forest undertaking. This annual report will document the types of treatments applied and describe the results of project monitoring.

The Forest Cultural Resource specialist should meet at least once a year with Forest Rangers and Staff to

discuss the report and the effectiveness of the PMOA as used on the Forest.

The annual report detailing treatment of sites under this PMOA will be submitted to the Regional Office by January 15 each succeeding year.

A monitoring plan for project and Forest program level review of sites and treatments made under this PMOA will be included in the Land Management Plan of the Forests using the PMOA.

9.3 Regional Program Monitoring

As part of the normal record of program reviews and monitoring trips, the Regional Archaeologist will review selected Forests or projects to ensure a uniform treatment of lithic scatter archaeological sites under this PMOA. This review may include review of the annual reports and special reports from Forests, and field visits to sites and projects.

The Regional Office will provide to the Oregon SHPO an annual report documenting the number of sites recorded, the number of sites found eligible and ineligible for the National Register, and the number of sites treated under this PMOA, based on the annual reports submitted to the Regional Office by the Forests. Informational copies of the minutes of the annual meetings and the annual reports will be provided to the Advisory Council for at least the first two years of this agreement's use. At that time, the Council will be contacted regarding their desire to continue receiving these documents. The Forest Service will consult with the Oregon SHPO on any studies needed to determine the effectiveness of the management strategy and any analysis conducted by the Forest Service to determine the effect of mitigation treatments applied. Initially, the Forest Service and the Oregon SHPO will meet annually regarding implementation of this program. On the basis of new information, the management strategy will be revised as appropriate. If revised, a copy will be provided to the Advisory Council in draft form in accordance with the provisions of the PMOA Stipulation III. Once the implementation of the management strategy is working to the satisfaction of the parties to this agreement, the Forest Service and Oregon SHPO may mutually agree to consult less often, but they must minimally review the program every three years.

10.0 GLOSSARY

Altitlhermal: A climatic period corresponding to the Early Archaic cultural period from 7500 to 5000 B.P. This Altitlhermal climate was an extended warming period with apparent long droughts as a result of a shift of the winds.

Anathermal: A climatic period corresponding to the Western Pluvial cultural period from 9000-7500 B.P. This anathermal climate was an extended cool, moist period.

Archalc Tradition or Period: A culture manifestation and ecological adaptive strategy dating between 7500 to 1500 B.P. This period is characterized by a varied resource utilization including seasonal round adaptations, big and small game hunting, and gathering of vegetal and seed foods. A traditional definition would include band size, egalitarian societies which may be appropriate for activities represented in the sites found in Eastern Oregon.

Archaeological or Cultural Resource: Material remains of past human life or activities such as pottery, arrowheads, basketry, bottles, rock carvings, stone circles, quarries, forts, cabins, and the like. Historic sites and artifacts are generally viewed as being at least 50 years old; prehistoric sites and artifacts are aboriginal in origin and predate Euro-American contact (circa 1800 A.D.)

Archaeological Site: A definable area containing artifacts and/or features representative of cultural entities and activities preserved in a geological context. Any place or locality where there is evidence of past human activity. An archaeological site can be as ephemeral as a surface scatter of flint flakes covering a few square feet to the remains of an earthlodge village covering several tens of acres. Site types include stone circles, lithic scatters, rockshelters, quarries, burial mounds, villages, petroglyphs, vision quest structures, conical timbered lodges, eagle trapping pits, buffalo jumps, miners' cabins, homesteads, and battlefields.

Artifact: Anything made or modified by human beings.

Assemblage: A discrete collection of artifacts from a given site, stratum, cultural horizon, area, etc.

Basalt: A form of igneous rock which is compact and dark gray to black. Used for many ground stone implements.

Big Game Hunter Stage: Synonymous with the Paleoindian stage. The name reflects the presumed emphasis of these nomadic peoples on large, now-extinct pleistocene mammals such as mammoth and bison.

B.P.: Before Present (i.e., before 1950 A.D.)

Buried Site: The cultural material of a buried site lies 10 cm or more below the soil surface.

Chipped Stone: Stone artifacts manufactured by percussion and/or pressure flaking techniques. Chipped stone implements are predominantly used as projectiles and as cutting, scraping, or skinning tools.

Chronology: The temporal ordering of data. Chronologies or time charts can involve absolute dating (i.e., dendrochronology, carbon-14 dating, historic documentation, etc.) or relative dating (i.e., stratigraphy, obsidian hydration, artifact typologies, ceramic seriation, etc.).

Clovis Culture: This is the earliest defined culture in the New World thought to have arrived into the Northwest Plains through an ice-free corridor from Asia approximately 11000 to 12000 B.P. This culture is identified by the characteristic Clovis fluted, lanceolate projectile point.

Component: A site, or any one of several cultures present at a given site.

Cultural Change: An anthropological concept that holds that human cultures can and do evolve (change) through time in nonrandom and possibly predictable ways. For the archaeologist, culture change is most clearly and frequently reflected in changes in artifactual style, form, and function.

Cultural Ecology: A theoretical approach which explains culture change in terms of ecological principals and Systems Theory. A cultural ecologist views societies or cultures as subsystems which by their very nature interact with other subsystems in a larger ecosystem. Cultural change is felt to come about as human groups respond and adapt (evolve) to changes in the biological and physical environment.

Cultural Resource Inventory: Documentation of all known archaeological resources within a given area. Inventories are usually generated through systematic field inspections or foot surveys.

Culture: The integrated system of learned behavior patterns which are characteristic of the members of a society and which are not the result of biological inheritance.

Diagnostic: Especially meaningful or significant.

Diagnostic Artifact: An artifact with characteristic traits of a particular cultural unit which can be placed within a specified time period and geographic area.

Debitage: Residual lithic material resulting from tool manufacture. Often useful to determine manufacturing techniques and for showing technological traits. Represents intentional and unintentional breakage of artifacts either through manufacture or function. Debitage flakes usually represent the various stages of progress of the raw material from the original form to the finished stage.

Euro-American: Artifacts, sites, individuals, groups, etc., most closely associated with an European descent or type of technology. Distinguished from American Indian sites, groups, etc.

Excavation: The scientifically controlled recovery of subsurface materials and information from an archaeological site. Recovery techniques are designed to produce maximum knowledge about the utilization of the site, its relation to other sites and the natural environment, and its significance in the maintenance of the cultural system. Recovery techniques may include the use of heavy equipment (e.g., backhoe, etc.) and specialized instruments (e.g., pollen coring tools, metal detectors). If excavation is the mitigative measure selected it is usually undertaken following the final design stage of the project.

Features: Non-portable remnants of past human activities such as hearths, flake debris distributions, housepit depressions.

Flake: The thin, flattened piece removed from a stone by pressure or percussion-flaking techniques. Flake tools are usually retouched.

Flint Knapping: The process of manufacturing stone tools.

Great Basin: The area of internal drainage in the western United States comprising Nevada, eastern California, southeastern Oregon, southern Idaho, and western Utah.

Ground Stone: Stone artifacts manufactured by pecking and abrading techniques. Usually included in this category are grinding and pounding implements such as the mano, metate, mortar, and pestle as well as pipes and statuary pieces.

Historic Period: That period which is described by written documents. The period in the Northwest Plains coinciding with the arrival of Lewis and Clark which represents the beginning of recorded accounts and events.

Intact Site: An intact site is one in which the physical properties that make up the site are undisturbed by historic human activities, (e.g., logging, road construction, vandalism).

Isolate: A single artifact (projectile point, scraper, utilized flake, etc.) or small flake cluster (10 or fewer flakes) that is not apparently associated with other cultural materials within a bounded area.

In situ: A Latin phrase meaning "in place." Archaeologically, it refers to an artifact or object being found in its original, undisturbed position. Items found in situ provide an opportunity for establishing firm stratigraphic or other contextual associations for dating or analytical purposes.

Knife: A bifacially retouched cutting tool. Many knives are mistakenly identified as "points," "spearheads," or "arrowheads".

Lanceolate: Lance-shaped, referring to projectile points. Lance-like or spear-like. Most commonly used in reference to chipped stone knives (bifaces) or projectile points which are long, slender and come to a point at one or both ends. Paleoindian projectile points are often described as "lanceolate in outline."

Literature Search: An examination of all written records (including published, unpublished, reproduced, and manuscript forms), books, articles, etc., pertinent to the investigations carried out for a cultural resource management study. Literature searches differ from records checks in that the latter usually are limited to formalized recorded information which is maintained as reference files.

Lithic: Stone. Lithic materials or artifacts are those made of stone.

Lithic Technology: Methods developed to produce stone tools. The archaeological record shows considerable change in stone manufacturing techniques or technologies over time and distance.

Material Culture: All physical items made or modified by human beings. Substantial varieties of material culture (i.e., clothing, cordage, basketry, skin bags, etc.) are infrequently preserved in the archaeological record.

Mediathermal: A climatic period corresponding to the middle-late Archaic cultural period from 5000 B.P. to present. This mediathermal climate was a period of wet and cooler conditions, with local fluctuations.

Native American: Commonly used in reference to people descended from the original inhabitants of North America.

Obsidian: Volcanic glass, which, because it can be worked to an extremely sharp edge and point, was highly prized for chipped stone implements.

Obsidian Hydration: A relative dating technique which measures the "hydration layer" (i.e., depth of water penetration) on the surfaces of obsidian artifacts.

Paleoclimatology: Study of past climatic regimes and conditions.

Paleoecology: Study of prehistoric ecological systems.

PaleoIndian: Composed of several cultures and complexes which date between 12,500 to 7,000 B.P. Known as nomadic hunters of how extinct big game at the close of the Pleistocene or Glacial period.

PaleoIndian Stage: The earliest widely recognized stage of human occupation in the Americas. PaleoIndian groups have been characterized as "Big Game Hunters." Their presence has been dated from around 12,000 B.P. to 7,000 B.P.

Palynology: The study of past vegetation and climates through microscopic and C-14 analyses of pollen recovered from stratified soil zones.

Patination: The process of oxidation or chemical alteration of the surface of an artifact by natural weathering or burial. Results in the formation of a cortex or weathered surface on stone.

Plateau, Columbia: The area between the Cascade and Rocky Mountains in the western United States, comprising southern and western Idaho and eastern Oregon and Washington and containing the drainage systems of the Snake and Columbia rivers.

Pleistocene: The geologic epoch dating from approximately 2 million years ago to 10,000 years ago.

Pluvial: Of or pertaining to rain. Also refers to the wetter periods during a major, extended dry period.

Preform: Intermediate stage in the production of stone tools. Preforms are often bifacially worked, are easily transported, and generally approximate the shape of the intended, finished stone tool.

Prehistoric: The period prior to the historic, before any written languages were present.

Projectile Point: Any stone, bone, or wood spear point, dart point, or arrowpoint.

Proto-Historic Period: A period represented in the archaeological record which exhibits the arrival of white trade items and influence before the actual arrival of white settlers.

Quarries: Source of stone raw material used to make stone tools. Commonly, the raw material is secured at the quarry site and reduced to a blank or a size and shape that is easily transported.

Radiocarbon Dating (Carbon-14 Dating): A means of establishing absolute dates for organic materials by measuring the ratio of radioactive Carbon-14 present in the material. Recent dates are corrected to account for previously unappreciated fluctuations in the rate at which organic materials received Carbon-14 molecules.

Riparian: Vegetative zone paralleling a perennial water course.

Rock Cairn: Regular or irregular pile of unhewn, locally available rocks often used as trail markers, boundary markers, burial markers, or to mark offering places.

Scraper: A stone implement used to remove fat from the underside of a skin, to smooth wood, to scrape leather, etc. Different types are described in terms of the shape and/or position of the cutting edge: side scraper, end scraper, snub-nosed scraper, thumbnail scraper, scoop scraper, etc.

Seasonal Round: Scheduled movement of human groups through various ecozones in the course of a year. Movement carefully planned to coincide with the seasonal availability of specific floral and faunal resources.

Settlement Patterns: A study based on the premise that behavior, and thus settlement, is patterned. These studies attempt to identify the pattern and reasons for specific site distribution patterns.

Site: Clusters of flakes and/or artifacts, structures, rock art, sugar trees, burials, or cairns. The definition of site used in these discussions is based on the:

1. Concentration of artifacts in a restricted location.
2. Amount and kind of artifact material (10 or more flakes.)
3. Integrity of the site and the amount of human-caused disturbance.

Site Significance: Determination of a site's scientific, historic, or archaeological value in relation to National Register of Historic Places eligibility criteria as directed by the National Historic Preservation Act of 1966 (amended 1980). Archaeological properties included in or eligible for inclusion in the National Register are most frequently nominated under Criterion "d" (36 CFR Part 60.6) which states that a property may qualify if it has "yielded, or may be likely to yield, information important in prehistory or history."

Source Analysis: The identification of lithic material with a particular location by trace element analysis, X-ray diffraction, or other qualitative methods.

Stratigraphy: An analytical interpretation of the structure produced by deposition of geological and/or cultural sediments into layers (or strata).

Subsistence Strategies: Refers to adaptations and knowledge of the environment, and thus availability of resources, by primitive peoples. A lifestyle adapted to the exploitation of different resources in different areas and during different seasons of availability.

Surface Site: A surface site is one in which the cultural material of the site is predominately contained within the top 10 cm of the soil.

Survey: A comprehensive and extended physical examination of a study area conducted for the purpose of obtaining reliable data on all cultural resources and associated environmental variables. This should provide information on all of the resources affected by the action. All sites should be described, categorized, and dated if possible. Their distribution should be noted. Test excavation may be necessary to identify the character, age, and significance of the resources. An intensive survey should result in recommendations and strategy (including time and cost estimates) for further investigative study.

Task Sites: Sites with limited artifact assemblages suggesting specific activities such as kill sites, butchering sites, etc.

Typology: The study of taxa or types. Refers to a study of the differences and similarities exhibited in cultural materials. The ordering of artifacts based on form, function, technology, material, color, shape, or any other qualifiable characteristic. Typologies may or may not have had validity in the minds of an artifact's creator.

Tradition: The persistence of a lifestyle or a cultural form over a long period of time and over a large geographic area.



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12.0 APPENDIX 1:

Research Topics Outline



Table of Contents
for
Research Topics Outline

	Page
I. Human-Environmental Relationships	42
A. Have environments changed?	42
B. How have people adapted to environmental change and stability?	43
C. How have humans manipulated the environment?	50
II. Variability In Hunter-Gatherer Lifeways.....	53
A. What is the variability in Hunter-Gatherer social systems?	53
B. What are the explanations for Hunter-Gatherer variability?	54
III. Technical Management Studies.....	66
A. Definition of surface site.....	66
B. Site formation processes.....	68
C. Cumulative impact studies	69
D. Site protection and stabilization studies.....	71



I. Human - Environmental Relationships

A. Have environments changed?

1. How do models of post-Pleistocene environmental change apply to National Forest areas?
 - a. What is the age, duration, and extent of the Anathermal?
 - i. Identify natural features affiliated with fluctuating lake levels.
 - ii. Geochronological, Paleoecological, and Archaeological dating methods.
 - iii. Synthesis and comparative analysis of acquired data.
 - b. What is the nature and extent of the Altithermal?
 - i. Glacial and Palynological studies.
 - ii. Paleodemography.
 - iii. Fossil record.
 - iv. Receding lake levels.
 - v. Paleozoology, Paleobotany.
 - vi. Soil studies, Geochronology.
 - vii. Sythensis and comparative analysis of acquired data.
 - c. What is the nature and extent of Medithermal climatic change?
 - i. Glacial and Palynological studies.
 - ii. Paleodemography.
 - iii. Fossil record.
 - iv. Receding lake levels.
 - v. Paleozoology, Paleobotany.
 - vi. Soil studies, Geochronology.
 - vii. Sythensis and comparative analysis of acquired data.
 - viii. Historical records.
 - ix. Volcanology studies.
 - x. Fire history.
 - d. What is the nature and extent of environmental change due to volcanism?
 - i. Hydrological pattern studies.
 - ii. Paleobotanical studies.
 - iii. Paleozoology.
 - iv. Tephra and soil studies.
 - v. Geomorphology studies.
 - vi. Comparative analysis with currently active volcanoes.
 - e. What are the environmental impacts caused by Western European expansion?
 - i. Historical records.
 - ii. Range studies.
 - iii. Hydrological manipulations studies.
 - iv. Demography.
 - v. Animal diversity and density.
 - vi. Plant diversity.
 - vii. Fire history.
 - f. What is the nature of micro-environmental variability in relation to the macro-environment?
 - i. Historical records.
 - ii. Range studies.
 - iii. Hydrological manipulations studies.
 - iv. Demography.
 - v. Animal diversity and density.



- vi. Plant diversity.
- vii. Fire history.

B. How have people adapted to environmental change and stability?

1. What are the cultural expressions during the Anathermal on these National Forests?
 - a. What is the age, duration, extent and range of variability among big game hunting traditions?
 - i. Establish chronology.
 - ii. Site function studies.
 - iii. Lithic analysis.
 - iv. Site organization studies (intrasite artifact distribution patterns).
 - v. Artifact function.
 - vi. Settlement patterns.
 - vii. Comparative analysis.
 - viii. Faunal and floral analysis.
 - ix. Site catchment analysis.
 - x. Seasonality (transhumance) studies.
 - xi. Paleoenvironmental reconstruction.
 - b. How were the populations distributed during the Anathermal? What was the density?
 - i. Chronology.
 - ii. Settlement pattern.
 - iii. Site organization studies.
 - iv. Seasonality studies.
 - c. What is the age, extent, duration and range of variability of the Western Pluvial Lakes tradition?
 - i. Establish chronology.
 - ii. Site function studies.
 - iii. Lithic analysis.
 - iv. Site organization studies (intrasite artifact distribution patterns).
 - v. Artifact function.
 - vi. Settlement patterns.
 - vii. Comparative analysis.
 - viii. Faunal and floral analysis.
 - ix. Site catchment analysis.
 - x. Seasonality (transhumance) studies.
 - xi. Paleoenvironmental reconstruction.
 - d. What is the nature and extent of human upland use during the Anathermal?
 - i. Chronology.
 - ii. Settlement pattern.
 - iii. Artifact function.
 - iv. Faunal and floral analysis.
 - v. Site function.
 - vi. Seasonality studies.
 - e. How and to what extent did these Anathermal cultural expressions change due to environmental factors?
 - i. Comparative analysis.
 - ii. Paleoenvironmental reconstruction.
 - iii. Chronology.

2. What were people's adaptations during the Altithermal?
 - a. How were the populations distributed during the Altithermal?
What was the density?
 - i. Chronology.
 - ii. Settlement patterns.
 - iii. Site organization studies (intrasite artifact distribution patterns).
 - iv. Seasonality studies.
 - b. What is the nature, extent, duration and range of Altithermal variability on economic systems?
 - i. Establish chronology.
 - ii. Site function studies.
 - iii. Lithic analysis.
 - iv. Site organization studies (intrasite artifact distribution patterns).
 - v. Artifact function.
 - vi. Settlement patterns.
 - vii. Comparative analysis.
 - viii. Faunal and floral analysis.
 - ix. Site catchment analysis.
 - x. Seasonality (transhumance) studies.
 - xi. Paleoenvironmental reconstruction.
 - c. What levels of social organization were present during the Altithermal?
 - i. Chronology.
 - ii. Site organization studies (intrasite artifact distribution patterns).
 - iii. Settlement patterns.
 - iv. Site function.
 - v. Seasonality studies.
 - d. What is the range of religious expressions during the Altithermal?
 - i. Chronology.
 - ii. Artifact (feature) function.
 - iii. Site organization (intrasite artifact distribution patterns).
3. What were people's adaptations to Medithermal climatic change?
 - a. How were the populations distributed during the Medithermal?
 - i. Chronology.
 - ii. Settlement patterns.
 - iii. Site organization studies.
 - iv. Seasonality studies.
 - b. What is the age and spread of bow and arrow technology?
 - i. Chronology.
 - ii. Artifact function.
 - iii. Point typology.
 - c. What is the age, extent, and rate of spread of the Numic expansion?
 - i. Chronology.
 - ii. Point typology.
 - iii. Artifact (feature) analysis (including sourcing, manufacturing techniques, artifact function, type distribution, and comparative analysis).
 - iv. Settlement patterns.
 - v. Oral traditions.
 - vi. Rock art studies.
 - d. What is the age, duration, extent, and range of variability of the Desert Archaic tradition?

- i. Chronology.
 - ii. Settlement patterns.
 - iii. Lithic analysis.
 - iv. Site organization studies (intrasite artifact distributions patterns).
 - v. Site function studies.
 - vi. Artifact function.
 - vii. Comparative analysis.
 - viii. Faunal and floral analysis.
 - ix. Site catchment analysis.
 - x. Seasonality studies.
 - xi. Oral tradition.
 - xii. Ethnographic analogies.
 - xiii. Rock art studies.
- e. How did humans utilize the upland environments?
- i. Chronology.
 - ii. Site distribution.
 - iii. Site function.
 - iv. Seasonality studies.
 - v. Ethnographic analogies.
 - vi. Oral traditions.
 - vii. Site catchment analysis.
- f. What is the age, duration, extent, and range of variability of the Plateau, semi-sedentary forager traditions?
- i. Chronology.
 - ii. Settlement patterns.
 - iii. Lithic analysis.
 - iv. Site organization studies (intrasite artifact distribution patterns).
 - v. Site function studies.
 - vi. Artifact function.
 - vii. Comparative analysis.
 - viii. Faunal and floral analysis.
 - ix. Site catchment analysis.
 - x. Seasonality studies.
 - xi. Ethnographic analogies.
 - xii. Rock art studies.
- g. What is the nature, extent, and duration of contact between adjacent groups?
- i. Chronology.
 - ii. Obsidian sourcing.
 - iii. Artifact typologies.
 - iv. Site function.
 - v. Ethnographic studies.
 - vi. Oral traditions.
 - vii. Trade goods sourcing.
 - viii. Resource distribution studies.
- h. What is the range of religious expressions of the Medithermal?
- i. Artifact function.
 - ii. Site function.
 - iii. Rock art studies.
 - iv. Ethnographic studies.
 - v. Oral history.
 - vi. Feature analysis.
 - vii. Chronology.

- i. What levels of social organization were present during the Medithermal?
 - i. Site organization.
 - ii. Ethnographic studies.
 - iii. Oral history.
 - iv. Inter-site comparative analysis.
 - v. Chronology.
4. What were people's adaptations to volcanic effects?
 - a. Is there cultural continuity between the pre- and post-Mazama volcanic periods?
 - i. Chronology.
 - ii. Lithic analysis.
 - iii. Settlement patterns.
 - iv. Site function.
 - v. Site organization.
 - vi. Floral and faunal analysis.
 - vii. Artifact functions.
 - viii. Comparative analysis.
 - b. Is there cultural continuity between the pre- and post-eruptive periods of volcanic events in the study area?
 - i. Chronology.
 - ii. Lithic analysis.
 - iii. Settlement patterns.
 - iv. Site function.
 - v. Site organization studies (intrasite artifact distribution patterns).
 - vi. Floral and faunal analysis.
 - vii. Artifact functions.
 - viii. Comparative analysis.
 - c. What is the nature and extent post-volcanic cultural expressions?
 - i. Site distribution.
 - ii. Site size.
 - iii. Site organization studies (intrasite artifact distribution patterns).
 - iv. Chronology.
 - d. What were the population distributions during the pre- and post-eruptive periods? What were the population densities?
5. What were people's adaptations to change in response to Euro-American expansion?
 - a. How did Euro-American diseases impact indigenous populations?
 - i. Historic records.
 - ii. Site organization studies (intrasite artifact distribution patterns).
 - iii. Feature (artifact) function.
 - iv. Chronology.
 - b. When and how were horses introduced to the area and how were they integrated into the Native American life styles?
 - i. Ethnographic studies.
 - ii. Oral history.
 - iii. Faunal analysis.
 - iv. Artifact (feature) function.
 - v. Chronology.

- c. When, how, and what kinds of Euro-American goods were utilized by Native American groups and how were these goods integrated into the culture?
 - i. Oral history.
 - ii. Ethnographic studies.
 - iii. Artifact function.
 - iv. Feature analysis.
 - v. Site function.
 - vi. Site organization.
 - vii. Artifact sourcing studies.
 - viii. Historical records.
 - ix. Chronology.
 - d. What is the nature, extent, and level of displacement of indigenous groups resulting from Euro-American expansion?
 - i. Oral history.
 - ii. Ethnography.
 - iii. Historical records.
 - iv. Range studies.
 - v. Hydrological studies.
 - vi. Faunal habitat studies.
 - vii. Fire history.
 - viii. Chronology.
 - e. What was the nature, extent, and degree of Euro-American agricultural impacts on indigenous resources?
 - i. Oral history.
 - ii. Ethnographic studies.
 - iii. Historical records.
 - iv. Settlement patterns.
 - v. Site organization.
 - vi. Seasonality studies.
 - vii. Chronology.
 - f. How did Euro-American settlement patterns affect indigenous population density and distribution?
6. To what extent did people utilize micro-environments to temper the effects of macro-environments?
- a. What aspects of various micro-environmental zones were utilized by aboriginal groups?
 - i. Catchment analysis.
 - ii. Site function.
 - iii. Floral and faunal analysis.
 - iv. Lithic sourcing and analysis.
 - v. Soil studies.
 - vi. Material sourcing.
 - b. What was the range of environmental variability within each zone?
 - i. Paleoenvironmental reconstruction.
 - ii. Seasonality studies.
 - iii. Soils studies.
 - iv. Geomorphology.
 - v. Fire history.
 - vi. Catchment analysis.

- c. Did the aspects utilized from micro-environments by aboriginal groups change through time and, if so, which ones and why?
 - i. Chronology.
 - ii. Floral and faunal analysis.
 - iii. Lithic sourcing.
 - iv. Site function.
 - v. Seasonality studies.
 - d. How were resources specific to micro-environments distributed to the population of the macro-environment?
 - i. Lithic sourcing and analysis.
 - ii. Site function.
 - iii. Artifact typologies.
 - iv. Floral and faunal analysis
- C. How have humans manipulated the environment?
- 1. What environmental impacts were caused by Euro-American expansion?
 - a. How did hydrologic manipulation and utilization change the natural water systems?
 - i. Historic records.
 - ii. Oral history.
 - iii. Hydrologic and geomorphological studies.
 - iv. Soil studies.
 - b. How did native flora and fauna change as a result of Euro-American agricultural practices?
 - i. Historical records.
 - ii. Range studies.
 - iii. Faunal habitat studies
 - iv. Oral history.
 - c. What were the effects of fire exclusion on the natural environment?
 - i. Historical records.
 - ii. Range studies.
 - iii. Fire history.
 - iv. Oral history.
 - d. What were the effects of logging, mining, transportation system development, etc. on the natural environment?
 - i. Historical records.
 - ii. Environmental impact studies.
 - iii. Oral history.
 - iv. Field observation.
 - e. How did Euro-American artifact forms and functions influence Native American artifacts?
 - i. Artifact typology.
 - ii. Lithic analysis.
 - iii. Comparative analysis.
 - iv. Artifact analysis.
 - v. Ethnographic studies.
 - vi. Oral history.
 - 2. To what extent did people consciously change their environment?
 - a. How did aboriginal groups use fire to change their environment?

- i. Ethnographic studies.
 - ii. Oral history.
 - iii. Fire history.
 - iv. Lithic analysis.
 - v. Floral studies.
 - vi. Feature analysis.
 - vii. Chronology.
 - b. Did aboriginal groups deliberately manipulate plant densities and distributions?
 - i. Ethnographic studies.
 - ii. Oral history.
 - iii. Fire history.
 - iv. Floral analysis.
 - v. Feature analysis.
 - vi. Range studies.
 - c. Were there cultural mechanisms that indirectly effected population densities and distributions of plant and animal species?
 - i. Seasonality studies.
 - ii. Settlement patterns.
 - iii. Demography.
 - iv. Animal behavior studies.
 - v. Range studies.
 - vi. Paleoenvironmental reconstruction.
 - vii. Plant habitat distribution studies.
 - d. What role did religious activities play in conscious efforts to manipulate the environment?
 - i. Ethnographic studies.
 - ii. Oral history.
 - iii. Feature (artifact) function.
 - iv. Rock art studies.
3. What were the effects on cultural systems of human-caused environmental change?
- a. How did fires effect the distribution of human populations?
 - i. Oral history.
 - ii. Ethnographic studies.
 - iii. Fire history.
 - iv. Settlement patterns.
 - v. Stratigraphic studies.
 - b. How did purposeful manipulation of biota effect the distribution of human populations?
 - i. Oral history.
 - ii. Ethnography.
 - iii. Settlement pattern.
 - iv. Range studies.
 - v. Floral analysis.
 - vi. Site function.
 - vii. Faunal habitat studies.
 - c. How did the extinction of Pleistocene megafauna effect human population distributions and resource utilization patterns?
 - i. Chronology.
 - ii. Settlement patterns.
 - iii. Artifact typology.



- iv. Site function.
- v. Paleoenvironmental reconstruction.
- vi. Comparative analysis.
- vii. Seasonality studies.
- viii. Feature analysis.
- d. How did obsidian acquisition and utilization patterns effect human population distribution and resource utilization?
 - i. Settlement patterns.
 - ii. Obsidian sourcing.
 - iii. Lithic analysis.
 - iv. Site function.
 - v. Artifact (feature) function.
- e. How did native cultures respond to environmental changes brought about by acquisition of the horse?
 - i. Ethnography.
 - ii. Oral history.
 - iii. Settlement patterns.
 - iv. Range studies.
 - v. Faunal habitat studies.
- f. How did groups respond to changes in the micro-environment caused by unintentional over-use and modification of this environment?
 - i. Settlement patterns.
 - ii. Oral history.
 - iii. Ethnography.
 - iv. Range studies.
 - v. Floral analysis.
 - vi. Site function.
 - vii. Artifact (feature) function.
 - viii. Artifact (typology).
 - ix. Seasonality studies.

II. Variability In Hunter-Gatherer Lifeways

- A. What is the variability in Hunter-Gatherer social systems?
 - 1. Verification of the ethnographic record using the Direct Historical Approach.
 - a. Verification of ethnographically documented site locations and settlement patterns.
 - i. Read ethnography.
 - ii. Search for sites.
 - iii. Record oral history as necessary.
 - b. Application of ethnographically-defined material cultural inventories to archaeological sites.
 - i. Analyses of all classes of artifacts and ecofacts.
 - ii. Architectural study of features.
 - iii. Study site structure and organization.
 - c. Verification of ethnographically reported population densities.
 - i. Study site size and areal densities.
 - ii. Study density of material in sites.
 - iii. Study site organization.
 - iv. Study site function.
 - v. Study settlement pattern.

- d. Verification of reported range of activities in specific sites.
 - i. Analyses of all classes of artifacts and ecofacts.
 - ii. Architectural study of features.
 - iii. Study site structure and organization.
 - iv. Study resource procurement patterns and site catchment analysis.
 - v. Study macro-environmental and micro-environmental setting.
 - vi. Study site seasonality.
- B. What are the explanations for Hunter-Gatherer variability?
- 1. Environmental determinism.
 - a. What are the distinctions between riverine and upland settings?
 - i. How have environmental distinctions between riverine and upland areas changed through time (if at all)?
 - a. Do Paleo-environmental reconstruction.
 - ii. How have population distributions between riverine and upland areas changed through time (if at all)?
 - a. Settlement pattern studies.
 - iii. Have riverine and upland environments been occupied by different or the same social groups at various points in time?
 - a. Reconstruct social group distributions.
 - iv. What have been the social and economic relationships between rivers and uplands through time?
 - a. Study trade patterns.
 - b. Study interaction spheres.
 - c. Study source analysis for lithic raw material.
 - b. What are relationships between High Desert and Forested Areas?
 - i. What uses were made of Forests?
 - a. Study Settlement patterns.
 - b. Study of resource exploitation patterns--site catchment analysis.
 - c. Site function studies.
 - d. Do Paleo-environmental reconstruction.
 - ii. What were high altitude adaptations?
 - a. Study settlement patterns.
 - b. Study of resource exploitation patterns--site catchment analysis.
 - c. Site function studies.
 - d. Do Paleo-environmental reconstruction.
 - iii. How is adaptation to changes in pluvial lakes reflected in Forest highlands?
 - a. Develop a chronology.
 - b. Study settlement patterns.
 - c. Study of resource exploitation patterns--site catchment analysis.
 - d. Do Paleo-environmental reconstruction.
 - iv. How do changes in animal behavior and distribution through time influence human populations?

- a. Study settlement patterns.
 - b. Study faunal exploitation patterns.
- v. What is the influence of pine-juniper ecotone on human use of area?
 - a. Study settlement patterns.
 - b. Study of resource exploitation patterns--site catchment analysis.
 - c. Do Paleo-environmental reconstruction.
- vi. What is the influence of the "thermal zone" (mid-range of a valley slope) on settlement?
 - a. Study settlement patterns.
 - b. Study of resource exploitation patterns--site catchment analysis.
 - c. Do Paleo-environmental reconstruction.
- c. What are the influences of climatic episodes on human use of the area?
 - i. What is the influence of Pluvial Lakes Period on human occupation/social structure?
 - a. Develop a chronology.
 - b. Settlement pattern study.
 - c. Do Paleo-environmental reconstruction.
 - d. Study resource exploitation patterns.
 - e. Study site function.
 - ii. What is the influence of the Altithermal on human occupation/social structure?
 - a. Develop a chronology.
 - b. Settlement pattern study.
 - c. Do Paleo-environmental reconstruction.
 - d. Study resource exploitation patterns.
 - e. Study site function.
 - iii. What is the influence of the Neo-thermal on human occupation/social structure?
 - a. Develop a chronology.
 - b. Settlement pattern study.
 - c. Do Paleo-environmental reconstruction.
 - d. Study resource exploitation patterns.
 - e. Study site function.
- d. What are the influences of micro-environmental variability on human occupation?
 - i. Document culture history of drainage basins.
 - a. Develop a chronology.
 - b. Settlement pattern study.
 - ii. What is the history of subsistence systems in each drainage basin?
 - a. Develop a chronology.
 - b. Study settlement patterns.
 - c. Study site function.
 - d. Study subsistence system.
 - iii. How has environment/geomorphology changed in these drainage basins?
 - a. Do Paleo-environmental reconstruction.

- iv. How have groups used micro-environments to cope with macro-environmental change?
 - a. Develop a chronology.
 - b. Study settlement pattern.
 - c. Study site function.
 - d. Study subsistence system.
 - e. Do Paleo-environmental reconstruction.
- v. How has nature of available water influenced occupation/social organization?
 - a. Study settlement pattern.
 - b. Study site function.
 - c. Do Paleo-environmental reconstruction.
- vi. How do changes in animal behavior, spatial or temporal influence human populations?
 - a. Study settlement patterns.
 - b. Study faunal exploitation patterns.
- vii. What is the influence of pine-juniper ecotone on human use of an area?
 - a. Study settlement patterns.
 - b. Study of resource exploitation patterns--site catchment analysis.
- viii. What is the influence of the "thermal zone" (mid-range of a valley slope) on settlement?
 - a. Study settlement patterns.
 - b. Study of resource exploitation patterns--catchment analysis.
 - c. Site function studies.
 - d. Do Paleo-environmental reconstruction.
- ix. What is the influence of the forest-grassland boundary on human use?
 - a. Study settlement patterns.
 - b. Study of resource exploitation patterns--site catchment analysis.
 - c. Site function studies
- x. What is the influence of fire on occupation?
 - a. Do Paleo-environmental reconstruction.
 - b. Develop a chronology.
 - c. Study settlement pattern.
 - d. Study site function.
 - e. Study subsistence systems.
- e. What is the influence of volcanism on human occupation?
 - i. What is the influence of particular eruptions on the environment?
 - a. Do Paleo-environmental reconstruction.
 - b. Faunal and floral studies.
 - ii. What were influences of eruptions of different magnitudes (or with differing periodicity) on human occupation?
 - a. Do Paleo-environmental reconstruction.
 - b. Faunal and floral studies.
 - c. Develop a Chronology (focus on sites associated with evidence of eruption).
 - d. Study settlement patterns.
 - e. Stratigraphic patterns.
 - iii. What are the influences of micro-environment on the effects caused by volcanic

- eruptions.
 - a. Do Paleo-environmental reconstruction.
 - b. Faunal and floral studies.
 - c. Develop a Chronology (focus on sites associated with evidence of eruption).
 - d. Study settlement patterns.
 - e. Stratigraphic studies.
- iv. What is the influence of post-eruptive condition on local/supra-local environments (e.g., reflective index, etc.)?
 - a. Do Paleo-environmental reconstruction.
 - b. Faunal and floral studies.
- v. What are the influences of different kinds of volcanic events (e.g., flows vs. eruptions)?
 - a. Do Paleo-environmental reconstruction.
 - b. Faunal and floral studies.
 - c. Develop a Chronology (focus on sites associated with evidence of eruption).
 - d. Study settlement patterns.
 - e. Stratigraphic studies.
- vi. What is the availability of volcanic resources (e.g., obsidian)?
 - a. Develop a chronology.
 - b. Do source analysis.
- f. What was the influence of the specific structure of local environments on human occupation?
 - i. What was the influence of presence/absence of lithic resources?
 - a. Paleo-environmental studies.
 - b. Study settlement patterns.
 - c. Do lithic sourcing.
 - d. Study interaction spheres.
 - ii. What was the influence of distribution of salmon through time?
 - a. Do Paleo-environmental studies..
 - b. Study settlement patterns.
 - c. Study interaction spheres.
 - iii. What was the influence of aggregated vs. dispersed resources?
 - a. Do Paleo-environmental studies.
 - b. Study settlement patterns.
 - c. Study interaction spheres.
 - d. Do lithic sourcing.
- 2. How Do Population Models apply to Hunter-Gatherer Variability?
 - a. What is the effect on human occupation of population growth in a limited space?
 - i. Is there evidence of population growth in various areas?
 - a. Develop a chronology.
 - b. Study settlement pattern.
 - c. Study site function.
 - d. Study subsistence systems.
 - e. Study site areal densities.
 - f. Study material density in site.
 - g. Do analysis of skeletal remains.



- ii. Is there evidence of diversification and/or intensification in resource use?
 - a. Study settlement pattern.
 - b. Study site function.
 - c. Study subsistence systems.
 - d. Do artifact analyses.
 - e. Study of flora and fauna.
- iii. What is the influence of mobility on population size?
 - a. Study settlement pattern.
 - b. Study site areal densities.
- b. What is the effect of population decline on human occupation?
 - i. Is there evidence of population decline? If so, what were the causal mechanisms (e.g., war, disease, environmental change, etc.)?
 - a. Develop a chronology.
 - b. Study settlement pattern.
 - c. Study site function.
 - d. Study site areal densities.
 - e. Study material density in sites.
 - f. Study subsistence systems.
 - g. Do skeletal analysis.
 - h. Do Paleo-environmental reconstruction.
 - ii. How is historically documented population decline reflected archaeologically?
 - a. Develop a chronology.
 - b. Study settlement pattern.
 - c. Study site function.
 - d. Study site areal densities.
 - e. Study material density in sites.
 - f. Study subsistence systems.
 - g. Do skeletal analysis.
 - iii. What were effects of depopulation (e.g., immigration, breakdown of interaction systems, changes in social organization, occurrence of unoccupied areas, reduced resource exploitation, etc.)?
 - a. Develop a chronology.
 - b. Study settlement pattern.
 - c. Study site function.
 - d. Study site areal densities.
 - e. Study material density in sites.
 - f. Study subsistence systems.
 - g. Do skeletal analysis.
 - h. Do Paleo-environmental reconstruction.
 - iv. How is historically documented population decline reflected archaeologically?
 - a. Develop a chronology.
 - b. Study settlement pattern.
 - c. Study site function.
 - d. Study site areal densities.
 - e. Study material density in sites.
 - f. Study subsistence systems.
 - g. Do skeletal analysis.



- c. What was the influence of population structure on human occupation?
 - i. What population structures occurred in study area?
 - a. Study settlement patterns.
 - b. Study site areal densities.
 - c. Study site function.
 - d. Study mortuary customs.
 - ii. What are relationships between various population structures and other aspects of culture?
 - a. Study settlement patterns.
 - b. Study site areal densities.
 - c. Study site function.
 - d. Study subsistence systems.
 - e. Study interaction spheres.
 - d. What is the relationship between migration and hunter/gatherer variability?
 - i. Can migration patterns be recognized in the study area?
 - a. Study settlement pattern.
 - b. Study subsistence systems.
 - c. Study interaction sphere.
 - d. Study site function.
 - e. Do lithic source analysis.
3. What is the effect of increasing (or decreasing) technological efficiency on hunter-gatherer social systems?
- a. What influence did technology have on environment to cause changes that had a feedback on human use?
 - i. What was the influence of fire?
 - a. Do Paleo-environmental reconstruction.
 - b. Study settlement pattern.
 - c. Study site function.
 - d. Study subsistence systems.
 - ii. What was the influence of the change from spear to bow and arrow?
 - a. Study settlement patterns.
 - b. Study subsistence systems.
 - c. Develop a chronology.
 - iii. What was the influence of the introduction of the horse?
 - a. Do artifact analyses.
 - b. Study settlement pattern.
 - c. Study subsistence systems.
 - d. Study site function.
 - e. Develop a chronology.
 - iv. Did a given group develop horticulture to a level where it would have had an effect? If so, what effect?
 - a. Study settlement pattern.
 - b. Study site function.
 - c. Study subsistence systems.
 - d. Do artifact analyses.
 - v. What was the influence of any of the developing technologies (e.g., basketry, fishing, food processing, food storage, housing, etc.) on the environment?

- a. Do artifact analyses.
 - b. Study settlement pattern.
 - c. Study site function.
 - d. Study subsistence systems.
- vi. What was the influence of early white contact on the environment?
 - a. Do Paleo-environmental reconstruction.
 - b. Study settlement pattern.
 - c. Study site function.
 - d. Study subsistence systems.
- vii. What was influence of humans on Pleistocene extinctions?
 - a. Do artifact analyses.
 - b. Study settlement pattern.
 - c. Study subsistence systems.
 - d. Develop a chronology.
- viii. What was the influence on the environment of increased reliance on obsidian?
 - a. Do artifact analyses.
 - b. Study settlement pattern.
 - c. Study subsistence systems.
- ix. What was influence of fuelwood gathering?
 - a. Study settlement pattern.
 - b. Study site function.
 - c. Study subsistence system.
- b. What are the influences of different adaptive strategies on social organization?
 - i. Do different adaptive strategies equate to different social organizations?
 - a. Study settlement pattern.
 - b. Study site function.
 - c. Study site organization.
 - d. Study subsistence systems.
 - ii. Do changes in adaptive strategies cause changes in social organizations?
 - a. Study settlement pattern.
 - b. Study site function.
 - c. Study site organization.
 - d. Study subsistence systems.

III. Technical Management Studies

- A. Definition of surface site.
 - 1. What processes move artifacts vertically?
 - a. What are the effects of inflating and deflating surfaces on artifact distribution?
 - i. Geomorphological studies.
 - ii. Soil deposition and erosion studies.
 - iii. Study artifact density distributions.
 - iv. Study stratigraphy.
 - v. Study mechanics of pedoturbation.
 - vi. Study integrity of features.

- vii. Factor out irrelevant effects.
 - b. What are the effects of past human-caused ground disturbing activities on archaeological sites?
 - i. Review historic documentation of past disturbances (e.g., logging, mining).
 - ii. Study mechanics of pedoturbation.
 - iii. Study artifact density distributions.
 - iv. Study artifact breakage patterns.
 - v. Study integrity of features.
 - vi. Factor out natural effects.
 - c. What are the effects of past naturally-caused ground disturbing activities on archaeological sites?
 - i. Soil and site setting study.
 - ii. Inventory the types of plants and animals affecting site.
 - iii. Identify bioturbation affects of specific plants/animals.
 - iv. Study stratigraphy.
 - v. Study artifact density distributions.
 - vi. Study artifact breakage patterns.
 - vii. Factor out cultural effects.
 - 2. Is there differential vertical redistribution of artifacts?
 - a. What significant patterns exist showing artifact redistribution?
 - i. Study the density distribution of artifacts by criteria, including:
 - a. Size.
 - b. Shape.
 - c. Weight.
 - d. Material.
 - e. Other.
 - ii. Study artifact breakage patterns.
 - b. What are the differences in vertical redistribution patterns caused by various natural and cultural processes?
 - i. Review historic documentation of past disturbances (e.g., logging, mining).
 - ii. Bioturbation studies.
 - iii. Conduct geomorphological studies, including:
 - a. Stratigraphy.
 - b. Soils.
 - c. Deposition.
 - d. Erosion.
 - e. Other.
 - iv. Study artifact density distributions.
 - v. Study artifact breakage patterns.
- B. Site formation processes.
- 1. What natural processes contribute to site formation?
 - a. Effects of erosion and deposition.
 - i. Identify soil type, characteristics, and setting.
 - ii. Identify flora and fauna.
 - iii. Study stratigraphy.
 - iv. Study hydrology.
 - b. Effects of bioturbation.
 - i. Identify soil type, characteristics, and setting.



- ii. Identify flora and fauna.
 - iii. Study stratigraphy.
 - iv. Study hydrology.
 - c. Effects of pedoturbation.
 - i. Identify soil type, characteristics, and setting.
 - ii. Identify flora and fauna.
 - iii. Study stratigraphy.
 - iv. Study hydrology.
 - d. Effects of volcanology.
 - i. Study stratigraphy.
 - ii. Study hydrology.
 - iii. Study volcanology.
 - 2. What cultural processes contribute to site formation?
 - a. What are the prehistoric cultural patterns which result in initial artifact deposition?
 - i. Study patterns of discard.
 - ii. Study site function including specific activities.
 - iii. Study patterns of site maintenance.
 - iv. Study site organization.
 - b. What prehistoric cultural patterns result in redistribution of cultural materials?
 - i. Study patterns of site maintenance.
 - ii. Study stratigraphy.
 - c. What historic cultural patterns result in redistribution of cultural materials?
 - i. Review historic documentation of past disturbances (e.g., logging).
 - ii. Study stratigraphy.
 - iii. Identify nature and extent of previous disturbances.
 - a. Study artifact breakage.
 - b. Study vertical/horizontal redistribution.
- C. Cumulative impact studies.
- 1. When is data recovery necessary?
 - a. What are the effects of multiple disturbances on archaeological sites?
 - i. Undertake a literature review of relevant impact analyses from archaeology and other fields.
 - ii. Review historic documentation of specific impacts to an area.
 - iii. Field examination of an area, including:
 - a. Stratigraphy
 - b. Artifact density distributions.
 - c. Artifact breakage patterns.
 - d. Integrity of features.
 - iv. Evaluate site integrity.
 - b. What are the different archaeological impacts caused by different equipment and logging systems?
 - i. Undertake a literature review of impacts caused by various equipment types and logging systems.



- ii. Inspect sites with known impacts using available techniques, including:
 - a. Stratigraphy.
 - b. Artifact density distributions.
 - c. Artifact breakage patterns.
 - d. Integrity of features.
 - iii. Conduct experimental studies.
 - c. How are different sites affected in different ways?
 - i. Undertake a literature review of impacts caused by various equipment types and logging systems.
 - ii. Inspect sites with known impacts using available techniques, including:
 - a. Stratigraphy.
 - b. Artifact density distributions.
 - c. Artifact breakage patterns.
 - d. Integrity of features.
 - iii. Conduct experimental studies.
 - d. At what point do natural processes trigger the need for mitigation (including data recovery where necessary).
 - i. Undertake a literature review of relevant impact analyses from archaeology and other fields.
 - ii. Review historic documentation of specific impacts to area.
 - iii. Field examination of an area, including:
 - a. Stratigraphy.
 - b. Artifact density distributions.
 - c. Artifact breakage patterns.
 - d. Integrity of features.
 - iv. Evaluate site integrity.
 - 2. When is the data base large enough so that current techniques will recover only redundant data?
 - a. What is the range of variability in site class?
 - i. Develop a site typology.
 - ii. Study settlement patterns.
 - iii. Compare specific sites to one another.
 - b. What research questions are relevant to what site types?
 - i. Do literature search.
 - ii. Develop data recovery plans with research designs.
 - c. At what point have relevant research questions been answered?
 - i. Ascertain relationship of data base to fulfillment of research design(s).
 - ii. Ascertain if new questions, methods, or techniques for recovering data have been developed.
- D. Site protection and stabilization studies.
- 1. When is protection and/or stabilization necessary?
 - a. When is site integrity compromised to the point that protection is required?
 - i. Document specific impacts.
 - ii. Conduct a field examination including inspection of:
 - a. Stratigraphy.

- b. Artifact density distributions.
 - c. Artifact breakage patterns.
 - d. Integrity of features.
- 2. What techniques could be applied to protect or stabilize sites?
 - a. Which techniques are relevant to specific site types or settings?
 - i. Do literature search for possible techniques.
 - ii. Apply techniques discovered or develop new techniques for application.
 - iii. Experiment to evaluate success of techniques.
 - b. Which techniques are relevant to specific site impacts?
 - i. Do literature search for possible techniques.
 - ii. Apply techniques discovered or develop new techniques for application.
 - iii. Experiment to evaluate success of techniques.



13.0 APPENDIX 2:

Office of Personnel Management 1975 Qualifications Standards for Positions Under the General Schedule HANDBOOK X-118

Archaeology Series, GS-193 and GS-102

INTERIM SINGLE-AGENCY QUALIFICATION STANDARD

Social Science Aid and GS-102

Technician Series

Archeology Technician, GS-102-4/7

U. S. DEPARTMENT OF AGRICULTURE

FOREST SERVICE

Description of Work

Archeology technicians perform technical work in indentifying areas believed to contain artifacts; conducting field reconnaissance and searches for evidence of archeological remains; photographing archeological sites and artifacts present within each site; classifying into well-defined categories such artifacts as ceramics, lithic, bone and wood; and preparing descriptive reports, cataloging the type of artifact, location and number.

Experience Requirements

	General (years) Experience	Specialized (years) Experience	Total (years) Experience.
GS-4	1 1/2	1/2	2
GS-5	2	1	3
GS-6	2	2	4
GS-7	2	3	5

General Experience

General experience is experience which provided the candidate with knowledges and skills in making measurements and calculations, preparing maps, using a compass, using maps and photographs for identification purposes, and in gathering, recording and assembling data. General experience may have been gained in such jobs as surveying, engineering, forestry, cartographic, or museum aid.

Specialized Experience

Specialized experience is experience such as described in the description of work which provided the candidate with knowledge of the practice with techniques, procedures and methods necessary to conduct an archeological reconnaissance survey. This includes the skill to identify, record and map the cultural resources found on a survey. Specialized experience may have been gained as a member of an archeological survey team or on an excavation project when such experience included the identification of artifacts excavated.

Excess specialized experience may be substituted for general experience.



Quality of Experience

For positions at any grade, the required amount of experience will not, in itself, be accepted as proof of qualifications. The candidates' record of experience and training must show that they possess the ability to perform the duties of the position for which being considered.

For eligibility at grade GS-4, the 6 months of required specialized experience must have been comparable in difficulty and responsibility to the GS-3 grade level in the Federal Service.

For eligibility at grade GS-5, at least 1 year of required experience, including 6 months of specialized experience must have been comparable in difficulty and responsibility to the GS-4 level in the Federal Service.

For eligibility at grades GS-6 and above, at least 1 year of the required specialized experience must have been comparable in difficulty and responsibility to the next lower grade in the Federal Service.

Substitution of Education for Experience

Successfully completed study in a residence school above high school level may be substituted for experience as specified below.

a. One year of college study which included a course in archeology, anthropology, surveying, engineering, cartography, photogrammetry, geology or math (except business math) may be substituted for 1 year of general experience.

b. Two years of college study which included 8 semester hours of archeology may be substituted for 2 years of experience, including 6 months specialized experience, and meets in full the requirements for GS-4.

c. Three years of college study which included 15 semester hours in archeology may be substituted for 2 1/2 years of experience, which includes 9 months specialized experience.

d. Successful completion of (1) a full 4 year course in a college or university leading to a bachelor's degree with a major study in archeology, or (2) 4 years of post high school academic study which included at least 20 semester hours in archeology of which 6 semester hours were in field archeological survey techniques, may be substituted for 2 years of general and 1 year specialized experience. This meets in full the experience requirements for GS-5 level.

Written Test

No written test is required.

Physical Requirements

Applicants must meet the physical requirements in paragraph 4, section V, Part II, Handbook X-118.

Archeology Technician, GS-102

Major Duties	Knowledge, Skills, Abilities and Personal Characteristics	Qualification Requirements, General Experience	Qualification Requirements, Specialized Experience
1. Conduct field searches for physical evidence of cultural remains.	Ability to examine and inventory cultural remains.	Course work in archeology, anthropology, surveying, engineering, cartography, geology, or math.	Experience as a member of an archeological survey team or excavation project when such experience included the identification of artifacts.
2. Identifies and records sites and artifacts using narrative descriptions, photographs, maps, sketches, diagrams, etc.	<ul style="list-style-type: none"> a. Ability to write narrative descriptions. b. Ability to photograph, map, sketch, or diagram. 	<ul style="list-style-type: none"> a. Course work in writing such as English composition, journalism, etc. b. Experience as an aid or technician where the work required recording data, using or plotting information on maps, or preparing sketches or diagrams. 	<ul style="list-style-type: none"> a. Experience as member of an archeological survey team or excavation project when such experience included the identification and recording of site and artifact information using narrative description, photographs, maps, diagrams, etc.
3. Identifies areas believed to contain artifacts from review of archeological, historical, and ethnographic literature and interviewing resource individuals.	<ul style="list-style-type: none"> a. Ability to examine records and documents to determine possible locations of cultural remains. b. Ability to interview individuals. 	<ul style="list-style-type: none"> a. Course work which required searches or records and documents. b. Experience interviewing individuals. 	<ul style="list-style-type: none"> a. Experience reviewing archeological, historical or ethnographic literature.
4. Assists in preparing cultural resource evaluation and inventory reports by making maps, providing data on survey methodology, and providing site descriptions.	<ul style="list-style-type: none"> a. Ability to prepare maps. b. Ability to present data in chart or diagrams. c. Ability to prepare narrative reports. 	<ul style="list-style-type: none"> a. Experience making maps, diagrams, and/or charts. b. Experience preparing narrative reports. c. Course work which required writing ability, i.e., English composition, journalism, etc. 	

Archeologist, GS-5/15
Supervisory Archeologist, GS-9/15

DESCRIPTION OF WORK

Archeologists perform professional work concerned with the scientific study of past human activities through the physical remains of life and past human activities. The work may include research, field investigations, laboratory analysis, library research, interpretation or consultative work, preparation of reports for publication, curation and exhibition of collections, or development and implementation of programs and projects which carry out such work. Such work requires a knowledge of professional archeological principles, theories, concepts, methods, and techniques.

**BASIC REQUIREMENT FOR ALL
PROFESSIONAL ARCHEOLOGIST
POSITIONS AT ALL GRADES**

Candidates must have successfully completed a full four-year or longer course of professional study in an accredited college or university leading to a bachelor's degree. The course of study must have included:

—3 semester hours each in the following:

—Courses concerned with history of archeology, i.e., an introduction to the discipline of archeology and culture history worldwide; development of archeological methods and techniques; and the theoretical underpinnings of archeology and its relation to anthropology and such other disciplines as history, geography, geology, and the environmental sciences.

—Courses concerned with archeology of a major geographical area such as North America, Africa, etc., i.e., survey of the archeology of the geographical area from the period of earliest occupation to the recent past, examining major broad patterns of cultural development, describing regional variations and recent discoveries.

*This standard supersedes the qualification standard issued in December 1968.

—Courses concerned with regional archeology, i.e., survey of archeological cultures and sites in a specific part or portion (e.g., Northwest Coast, Plains, Southeast) of a major geographical area (e.g., North America) to acquire or develop a foundation for regional specialization for professional development.

—Courses concerned with theory and methods of archeology, i.e., an examination of archeological methods and theoretical approaches for reconstructing and interpreting past human behavior. Methods include but are not limited to typology, classification, sampling, cultural evolution, diffusion, dating, and analytical techniques.

—Courses concerned with archeological field school, i.e., a basic understanding of theoretical and practical approaches to research design implementation; survey; excavation; documentation; mapping; data collection, processing, and analysis; field preservation techniques; and report preparation by participation in actual field work.

AND

—6 semester hours of related course work in:

- geography, geology, or cultural geography;
- history, historiography, or historical archeology;
- environmental studies;
- scientific writing (nonfiction English composition); and/or
- surveying; and
- archeological field school.

ALTERNATE REQUIREMENT

Candidates may substitute for the basic requirement an alternate requirement of college-level education, training, and/or technical experience that furnished (1) a thorough knowledge of the sciences underlying professional archeology and (2) a good understand-

GS-193
(p. 2)

ing, both theoretical and practical, of the archeological principles, methods, and techniques and their applications to the study of historic and prehistoric cultures. This knowledge and understanding must be equivalent to that provided by a four-year or longer professional curriculum, with respect to (a) the knowledge and skills required to perform professional archeological work in the position to be filled and (b) the ability to develop and progress as a professional archeologist. The adequacy of such background must be demonstrated by one of the following.

1. *Related Curriculum*—Successful completion of a course of study in an accredited college or university leading to a bachelor's degree in anthropology (with emphasis on ethnology, physical anthropology, or scientific linguistics), history, American studies, or related discipline may be accepted as satisfying in full the alternate requirement, provided the curriculum supplies the academic course work sufficiently similar to the basic requirement (including archeological field school) to warrant comparable treatment.
2. *Experience*—Four years of archeological work experience of such character and diversity as to be a satisfactory substitute for the basic requirement. This experience must have demonstrated that the candidate has acquired a thorough knowledge of the fundamental principles and theories of professional archeology and possesses an understanding of the field of archeology comparable to that normally acquired through successful completion of the full course of study in an accredited college or university. The work experience must have included archeology field experience, which may include that gained in an archeological field school. Field experience should include a combination of professional experience in archeological survey, excavation, laboratory analysis and preparation of written materials. The nature and

quality of such field experience should be such that, after additional experience under the direction of a higher grade archeologist, the candidate would be able to demonstrate the ability to be a crew chief, directing the work of others at a single location as a part of a larger archeological project.

3. Any time-equivalent combination of experience and education as defined above under the Basic Requirement or under the Related Curriculum.

The basic and alternate requirements which apply to all grades are fully qualifying for grade GS-5.

ADDITIONAL REQUIREMENTS FOR POSITIONS AT GS-7 AND ABOVE

Candidates for grades GS-7 and above must have had professional experience or graduate education (or an equivalent combination of both) in addition to meeting the basic or alternate requirements. Such professional experience or graduate education must have equipped the candidate with the knowledge and skill to perform fully the work of the position for which the candidate is being considered. Note: See the criteria in Part II, Section III of this handbook for evaluating full-time and part-time graduate study.

1. *Experience*

In addition to the basic or alternate requirements, the following amounts of professional experience are required for grades GS-7 and above:

Grade:	Minimum amount of professional experience directly related to the position being filled Years
GS-7	1
GS-9	2
GS-11 and above	3

For grade GS-11 and below, at least six months of the required experience must

(TS 204)
August 1983

have been at the level of difficulty comparable to the next lower grade, or one year comparable to the second lower grade, in the Federal service. For grades GS-12 and above, at least one year of the required experience must have been at a level of difficulty comparable to that of the next lower grade in the Federal service.

2. *Education*¹

In addition to the basic or alternate requirements, the following amounts and levels of education are qualifying for grades GS-7 and above, as shown:

<i>Grade</i>	<i>Minimum amount of graduate education in appropriate subject matter fields</i>
--------------	--

GS-7.....	Successful completion of all requirements for a master's degree for which at least one full academic year of graduate study is required.
-----------	--

OR

Successful completion of one full academic year of graduate education.

GS-9.....	Successful completion of all requirements for a master's or equivalent degree for which at least two full academic years of graduate study are required.
-----------	--

OR

Successful completion of two full years of graduate education.

GS-11.....	Successful completion of all requirements for a doctoral degree (Ph.D. or equivalent).
------------	--

OR

Successful completion of three full academic years of graduate education.

3. *Combination of professional experience and graduate education*

Equivalent combinations of professional archeological experience and graduate education of the type described above are acceptable at each grade.

¹ The superior academic achievement provision may not be used to fill positions in this series.

PROFESSIONAL EXPERIENCE
REQUIREMENTS

Experience may have been gained in the performance of professional archeological survey, excavation, laboratory analysis, and report preparation to obtain demonstrated knowledge of the appropriate fundamental principles and theories and the skills and technical competence in the use of scientific methods and techniques of archeology.

For GS-7—Candidates should demonstrate the knowledge and skills to be a crew chief, participate in the development and planning of a single archeological field project, and direct the implementation of such a project.

For GS-9—The work experience must have demonstrated a working knowledge of methods and techniques applicable to archeology. Archeological work required in educational courses such as archeological field schools and laboratories are not to be used in lieu of actual work experience. It must also have demonstrated skill in the investigation, treatment, and analysis of basic data in preparing interpretative and analytical reports. For example, candidates should demonstrate the knowledge and skills to participate with other more experienced archeologists in the development and planning of a single archeological field project and have directed the implementation of such a project, including preparation of technical reports.

For GS-11—The work experience must have demonstrated that the candidate possesses the ability to perform archeology work of some difficulty and responsibility. The experience must demonstrate the knowledge and skills to develop, plan, and supervise implementation of original, independent fieldwork at multiple archeological field projects or increasingly more complex single projects, including preparation or supervision of preparation of technical reports. The experience must also demonstrate a full understanding of budgeting, administering, and managing projects, and conferring with higher management on the implementation of projects.

GS-193
(p. 4)

ARCHEOLOGY SERIES

For GS-12—The work experience must have demonstrated skill, knowledge, and technical competence in the use of (a) scientific and mathematical theories and principles applicable to archeology, (b) professional or scientific inquiry and analysis in the solution of difficult and complex problems, and (c) substantive topical and regional data, e.g., the knowledge and skills to develop and manage archeological programs, ranging from single geographic areas within regions to major geographic areas encompassing a number of regions. Ability to prepare thorough and comprehensive reports relating to difficult problems must also be demonstrated.

For GS-13—The work experience must have demonstrated that the candidate possesses a thorough understanding of scientific principles and theories underlying archeology and a wide knowledge of concepts, factors, and conditions necessary to develop and implement archeological programs. The experience must have demonstrated the candidate's ability in the organization, direction, and coordination of complicated and important projects, programs, or studies, or marked technical competence and creativity in original scientific inquiry in developing new methods or new insight into relationships involved in complex archeological areas.

For GS-14 and GS-15—The work experience must (a) demonstrate a thorough knowledge and understanding of the scientific principles and theories applicable to archeology and (b) result in new information or advances concerning various alternative courses of action to resolve exceedingly complex archeological problems. Experience must demonstrate: (1) skill and facility in the organization, direction, and coordination of complex and difficult projects; (2) exceptional competence in creative activities of high calibre resulting in important contributions to the fundamental knowledge of archeology; and (3) ability to conduct high-level consultative and/or advisory work in formulating, presenting, and carrying out far-reaching changes in archeological programs, plans, and policies.

(TS 204)
August 1983

SELECTIVE FACTORS

Archeologists apply an understanding of the principles of archeology and related sciences and technologies. Some archeologist positions however require a particular knowledge or combination of knowledge and skills as essential requirements for satisfactory performance. For example, archeologists may work their way into a given culture or geographical area (e.g., North America, Latin America, the West Indies, Europe, or India) which remains a continuing interest even though they later pursue certain topical or theoretical interest over wide areas, or develop a second area for comparative purposes. This pattern provides regional specialists for programs or projects which require recruitment of archeologists based on specialized knowledge of the cultural history peculiar to a given area.

It may be appropriate to use these requirements as selective factors, i.e., only those candidates who have the appropriate knowledge and skills are referred for employment consideration. Where selective factors are used, they must be demonstrably related to the knowledge, skills, and other characteristics considered essential for satisfactory performance of the duties of the position.

The appropriateness of the selective factors (1) should be reflected in the duties and responsibilities of the position as presented in the position description or in other official information provided by the agency and (2) must not establish an unreasonably high or overly restrictive requirement. Selective factors should not be used if it is evident that other eligibles could perform satisfactorily after a customary training period.

QUALITY RANKING FACTORS

Agencies may develop quality ranking factors to assist in determining which applicants are best qualified.

These do not affect the basic qualification requirement, but must be directly related to the duties and responsibilities of the position

ARCHEOLOGY SERIES

GS-193

(p. 5)

to be filled. Quality ranking factors must also distinguish various levels of performance, particularly superior performance, since they are used to determine which of the eligible candidates are to be included in the group from which supervisors and managers will make final selections.

SUPERVISORY POSITIONS

For supervisory positions, the qualification standard for Supervisory Positions in General Schedule Occupations, in Part III of this handbook should be used in conjunction with this standard.

INSERVICE PLACEMENT ACTIONS

For inservice placement actions, candidates must clearly show the ability to perform archeological work at the level sought. Mere tenure in a professional archeologist position for a period of a year does not automatically qualify the employee for professional work on the next higher level.

The provisions of 5 C.F.R. 300, Subpart F, must be complied with concerning the rate at which employees may be promoted, irrespective of their qualifications.

BASIS OF RATING

Candidates will be rated on a scale of 100 on the basis of an evaluation of their personal and professional qualifications as indicated by the data furnished in their application forms, and by information which may be gained through inquiries to their supervisors, associates, and other professional references.

AMENDED EDUCATIONAL REQUIREMENTS

This standard is subject to the provisions of the Amendment of Educational Requirement for Most Professional Positions in Science and Technology as stated in Section III, part II of this handbook.

PHYSICAL REQUIREMENTS

The following requirements apply to employees occupying positions covered by this

standard as well as to applicants for such positions.

Applicants and employees must have the capacity to perform the essential functions of the position without risk to themselves or others. In most cases, a specific medical condition or impairment will not automatically disqualify an applicant or employee. A physical condition or impairment may be disqualifying if the condition, for good medical reason, precludes assignment to or warrants restriction from the duties of the specific position. The loss or impairment of a specific function may be compensated for by the satisfactory use of a prosthesis or mechanical aid. Reasonable accommodation shall also be considered in determining an applicant's ability to perform the duties of a position. Reasonable accommodation may include, but is not limited to, the use of assistive devices, job modifications or restructuring, provision of readers and interpreters, or adjusted work schedules.

In positions where there is exposure to environmental agents for which there are occupational environmental standards which require protective measures or medical surveillance, applicants and employees shall undergo initial and periodic evaluation in accordance with the surveillance requirements.

Also, all positions involving operation of a Federal motor vehicle carry the additional material requirements specified in the Federal Personnel Manual (FPM) Chapter 930, Appendix A, Physical Standards for Motor Vehicle Operators and Incidental Operators.

REQUIREMENTS FOR MOTOR VEHICLE OPERATION

For those positions in which operating a motor vehicle is essential to the efficient performance of the work, candidates are required to:

(TS 204)
August 1983

GS-193
(p. 6)

ARCHEOLOGY SERIES

- possess, or obtain within 30 days of employment, a valid State driver's license, and
- qualify, after appointment, for authorization to operate motor vehicles in accordance with applicable U.S. Government regulations and with related requirements of the employing agency. (See FPM Chapter 930.)

GUIDE FOR EVALUATING CANDIDATES

Evaluating Education

In evaluating the nature and quality of education and training offered by candidates, consideration should be given to the following.

1. The nature and quality of undergraduate education is used to evaluate candidates at the GS-5 level. Undergraduate training has less significance at higher grade levels when compared with graduate education and professional experience.
2. In general, courses dealing with the fundamental principles and theoretical concepts of archeology are of higher value, and provide a better base for future professional development, than courses primarily oriented toward the application of particular methods and techniques for the solution of specific problems.
3. Certain archeologist positions require preparation in other professional disciplines or lines of work. In evaluating candidates, consideration should be given to course work related to the specialized demands of the position being filled and to the target position in the career ladder. Illustrative of acceptable courses are:
 - Courses concerned with architectural history, i.e., ideas, philosophies, and processes that establish a basis or procedure for creating architectural form and space; dominant works and trends in Western World architecture; building types to house cultural institutions and major monuments; influence of social attitudes and cultural values on architecture; influence and interactions of related fields such as engineering, sociology, psychology, arts, and humanities.
 - Courses concerned with history, i.e., any number of comprehensive courses which focus on aspects of social, economic, political, intellectual, cultural systems, and change.
 - Courses concerned with historiography, i.e., study of the diverse approaches to analysis or interpretation of historical data, including traditional chronological, regional, comparative, quantitative, and systems approaches.
 - Courses concerned with historical archeology, i.e., the application of anthropological methods and theories to archeological sites and data for which documentary information exists.
 - Courses concerned with geography, i.e., an introduction to the principles of geography, historical geography, human geography, climatology, and quantitative geographic techniques.
 - Courses concerned with statistics, i.e., principles of statistical analysis, basic techniques for quantitative description and reference.
 - Courses concerned with computers, i.e., introduction to how computers work, principles and operation, practical application and beginning use.
 - Courses concerned with geology, i.e., introduction to historical and physical geology—history and principles, geomorphology, basic identification, and analysis.
 - Courses concerned with surveying, i.e., survey methods and tools, use of transit, alidade, and plane table—basic mapping techniques and methods.

(TS 204)
August 1983

- Courses concerned with osteology, i.e., study of the human skeleton, laboratory identification, preservation, measurement, and interpretation. (Note: May be medical or physical anthropology oriented.)
 - Courses concerned with botany and/or zoology, i.e., basic plant and animal taxonomy and identification, and vertebrate osteology.
4. Appropriate quality ranking credit may be given to related course work over and above the minimum requirements.

Evaluating Experience

In evaluating the nature and quality of experience offered by candidates, consideration should be given to the following.

1. Professional archeology experience required for positions at grade GS-9 and above is characterized by all three of the following:
 - a. *Professional knowledge of archeology* which is defined as the comprehensive, indepth knowledge of archeology, typically acquired in a four year professional curriculum.
 - b. *Skill to apply archeology* which is defined as the ability to: (a) apply fundamental and diversified archeology concepts, theories, and practices to achieve objectives; (b) adapt and apply methods and techniques of other disciplines; and (c) organize, analyze, interpret, and evaluate scientific, technical, or other data in the solution of archeological problems.
 - c. *Positive and continuing development of professional knowledge and skill* which is defined as involving activities such as:
 - developing new approaches, methods, or techniques for the solution of archeological problems;
 - formal training and guidance by experienced professionals;

- undergraduate, graduate, or postgraduate academic study;
 - active participation in seminars, conferences, and committees of professional societies and other organizations;
 - publication of professional papers or similar significant contributions to the profession and its literature; or
 - honorary or other form of recognition including such recognition as being cited in publications or other ways for work accomplishments or expertise; or being invited to speak or present papers to professional groups.
2. When experience is substituted for education, it should provide the *equivalent* background.
 3. In addition to experience which meets minimum requirements (including selective factors) other experience which provides job-related knowledge and skill (e.g., in functional categories or relevant subject matter) should receive appropriate quality ranking credit.

14.0 APPENDIX 3:

**Proposed Rules
Department of the Interior, National Park Service
36 CR Part 66
Recovery of Scientific, Prehistoric, Historic, and
Archaeological Data: Methods, Standards, and Reporting
Requirements**

Appendix C: Professional Qualifications

FEDERAL REGISTER Vol 42, No. 19, January 28, 1977

Appendix C:

Professional Qualifications

1. Basic professional Occupation Standards. It is essential that any project proposal identify suitably qualified key professional personnel. Basic minimum qualifications for these types of personnel who most often serve as principal investigators and key consultants on contract projects are given below. Agencies which undertake or evaluate identification or data recovery projects using their own employees should also insure that these qualifications are possessed by appropriate staff in a manner consistent with applicable Civil Service requirements. Professional personnel of the Department of the Interior are available at all times to consult with other Federal, State and Local agencies regarding the application of these criteria in given instances. For these services agency officials should contact the Chief Office of Archaeology and Historic Preservation, National Park Service, Department of the Interior, Washington, D.C., 20240. In the following definitions, a month of professional experience need not consist of a continuous month of full-time work but may be made up of discontinuous periods of full-time or part-time work adding up to the equivalent of a month of full-time experience.
 - a. History. The minimum professional qualifications in history are a graduate degree in American history or a closely related field: or a bachelors degree in history or a closely related field and one of the following:
 - (a) At least two years of full-time experience in research, writing, teaching, interpretation, or other demonstrable professional activity with an academic institution, historical organization, or agency, museum, or other professional institution, or:
 - (b) substantial contribution through research and publication to the body of scholarly knowledge in the field of history.
 - b. Archaeology. The minimum professional qualifications in archaeology are:
 - (a) A graduate degree in archaeology, anthropology, or other closely related field or equivalent training accepted for accreditation purposes by the Society of Professional Archaeologists,
 - (b) demonstrated ability to carry research to its completion, usually evidenced by timely completion of theses, research reports, or similar documents, and
 - (c) at least 16 months of professional experience and/or specialized training in archaeological field, laboratory, or library research, administration or management, including at least 4 months of archaeological field research and at least one year experience and/or specialized training in the kind of activity the individual proposes to practice. For example, persons supervising field archaeology should have at least one year or its equivalent in field experience and/or specialized field training, including at least 6 months in a supervisory role. Persons engaged to do archival or documentary research should have had at least one year experience or specialized training in such work. Archaeologists engaged in regional or agency planning or compliance with Historic Preservation procedures should have had at least one year experience in work directly pertinent to planning, compliance

sections, etc., and/or specialized historic preservation or cultural resource management training. A practitioner of archaeology should have at least one year of experience or specialized training in research concerning archaeological resources of the prehistoric period. A practitioner of historic archaeology should have had at least one year experience in research concerning archaeological resources of the historic period. Experience in archaeological research in the region where the project will be undertaken is usually desirable.

- c. Architectural History. The minimum professional qualifications in architectural history are a graduate degree in architectural history, historic preservation, or closely related field, with course work in American architectural history: or a bachelors degree in architectural history, with a concentration in American architecture: or a bachelors degree in architectural history, historic preservation: or a closely related field plus one of the following:

- (1) At least two years full-time experience in research, writing, or teaching in American history or restoration architecture within academic institution, historical organization or agency museum, or other professional institution;

- (2) substantial contribution through research and publication to the body of scholarly knowledge in the field of American architectural history.

- d. Architecture. The minimum professional qualifications in architecture are a professional degree in architecture plus at least two years full-time professional experience in architecture; or a state license to practice architecture.

- e. Historical Architecture. The minimum professional qualifications in historical architecture are a professional degree in architecture or a state license to practice architecture, plus one of the following:

- (1) At least one year of graduate study in architectural preservation, American architectural history, preservation planning, or a closely related field and at least one year of full-time professional experience on preservation and restoration projects: or

- (2) at least two years of full-time professional experience on preservation and restoration projects. Experience on preservation and restoration projects shall include detailed investigations of historic structures, preparation of historic structures research reports, and preparation of plans and specifications for preservation projects.

15.0 APPENDIX 4:

Lithic Scatter PMOA Eligibility Determination Form

Determination Form

FOREST: _____ DATE: ____/____/____
YR MO DAY

DISTRICT: _____

PROJECT: _____ COUNTY: _____

LITHIC SCATTER PMOA

The following Prehistoric Sites have been determined eligible under the Lithic Scatter PMOA:

Temporary Number

Perm. Number

USGS Quad

[illegible]

CONCUR _____

BY: _____

16.0 APPENDIX 5:

Lithic Scatter PMOA

PROGRAMMATIC MEMORANDUM OF AGREEMENT

WHEREAS, the U.S. Forest Service, Pacific Northwest Region, is responsible under the Organic Act (16 U.S.C. 473), the National Forest Management Act (16 U.S.C. 1609), and the Multiple Use - Sustained Yield Act (16 U.S.C. 528) to manage timber and other resources on National Forest System land and in certain instances timber management activities may affect archeological sites containing predominantly lithic cultural materials; and

WHEREAS, pursuant to Section 106 of the National Historic Preservation Act as amended (16 U.S.C. 470f), Section 2(b) of Executive Order 11593, "Protection and Enhancement of the Cultural Environment," and the regulations of the Advisory Council on Historic Preservation (Council), "Protection of Historic and Cultural Properties" (36 CFR Part 800), the Forest Service has requested the comments of the Council; and,

WHEREAS, pursuant to Section 800.8 of the Council's regulations, representatives of the Council, Forest Service, and the Oregon State Historic Preservation Officer (SHPO) have consulted and reviewed the proposed Programmatic Memorandum of Agreement (PMOA);

NOW, THEREFORE, it is mutually agreed that the Forest Service may proceed with its timber management program in accordance with the following stipulations to avoid or mitigate adverse effects on archeological sites containing predominantly lithic cultural materials.

Stipulations

The Forest Service will insure that the following measures are carried out in management of lithic-dominated archeological sites affected by timber management programs in the Winema, Fremont, Deschutes, Ochoco, Malheur, Wallowa-Whitman, and Umatilla National Forests in Oregon.

I. Overviews

The existing historic property overviews for each affected forest will be reviewed to determine whether they conform to the Overview Guidelines in Attachment A. Any revision necessary to bring the overviews into conformance with the Guidelines will be undertaken within two years. For those forests that do not have an historic property overview, one will be developed in accordance with Attachment A within two years of ratification of this agreement.

II. Management Strategy

Using the historic property overviews as a base, the Forest Service will develop a regional management strategy for identification and treatment of lithic-dominated archeological properties affected by its timber management program. This strategy will meet the standards in Attachment B "Strategy Standards" and will define the term "lithic-dominated archeological property" as used in this agreement.

III. Consultation

The Forest Service will develop the management strategy in consultation with the Oregon SHPO. Once a management strategy has been developed, it will be submitted in draft form to the Council and the Oregon SHPO. Should the Council and Oregon SHPO comment favorably on the draft management strategy, or not comment within 30 days after receiving it, the management strategy will be implemented. Should the Council or Oregon SHPO object to any portion of the management strategy, the Forest Service will consult with the Council and the Oregon SHPO to resolve the objectives before implementation.

IV. Treatment of Other Historic Properties

Until all historic, architectural and non-lithic-dominated archeological sites are covered by the regional management strategy, the Forest Service must make appropriate efforts to identify these types of sites that meet National Register Criteria (36 CFR Part 60). Should such sites be affected by timber management or other programs of the Forest Service, it will follow the Council's regulations (36 CFR Part 800) in complying with Section 106.

V. Continuing Review

Initially the Forest Service and the Oregon SHPO will consult annually regarding implementation of this program. In order to facilitate this, the Forest Service will provide the Oregon SHPO with the archeological reports detailing actions taken by the Forest Service in accordance with the provisions of this agreement and with any studies suggested by the Oregon SHPO to determine the effectiveness of the management strategy. On the basis of new information the overviews and management strategy will be revised as appropriate. If revised, a copy will be provided the Council in draft form in accordance with the provisions of Stipulation III. Once the implementation of the management strategy is working to the satisfaction of the parties to this agreement, the Forest Service and Oregon SHPO may mutually agree to consult less often, but they must minimally review the program each three years. Any party to the PMOA may withdraw after providing 90 days notice and explaining the reason for withdrawal.

VI. Resolution of Disagreements

Should the Forest Service and the Oregon SHPO not be able to arrive at a mutually acceptable solution to implementation of the management strategy for a particular archeological site, they will consult further with the Council to resolve the issue.

VII. Interim Management

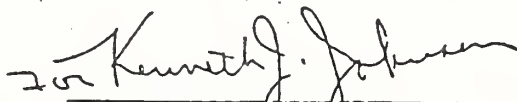
Until a management strategy is developed, reviewed pursuant to Stipulation III above, and then implemented, the Forest Service will follow the guidelines below:

- A. Any historic property that, based on field survey data supplemented by appropriate background research is found to (a) have no evident architectural remains, (b) have no historical or cultural importance to contemporary communities or ethnic groups, (c) have no evidence of human burials, (d) have no evidence of complex stratigraphy, and (e) be composed of flaked lithic artifacts and debris will be regarded as a "lithic-dominated site."
- B. Inventory, evaluation, and treatment of lithic-dominated archeological sites will be carried out in consultation with the Oregon SHPO. The Oregon SHPO must approve all data recovery programs proposed when recovery work is necessary. In addition, data will be gathered for use in development of the management strategy required by Stipulation II above.
- C. Lithic-dominated sites will be assumed to have potential value for the data they contain about human use of the Forests through time, and it will be understood that extracting such data requires study of the horizontal and vertical organization of lithic-dominated sites, relative and absolute dating of such sites, comparison of such sites with one another, and with other classes of sites, study of the environments in which such sites exist, and study of any chemical, sedimentological, mineralogical, palynological, or stratigraphic data they may contain that would bear on their age, function, or previous environmental setting.
- D. Where an activity that might disturb a lithic-dominated site is proposed, the Forest Service will consider:
 1. the components of the impacting activity, to define the specific type, degree, extent and duration of impacts;

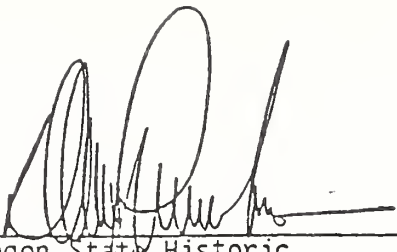
2. the categories of data likely to be present in the site subject to impact, to determine whether categories of data useful for the purposes set forth in Stipulation VII.C. above are likely to be adversely affected by the various components of the activity; and
 3. any steps that might be taken, without adversely affecting the objectives or efficiency of the proposed activity, to reduce to an acceptable level any adverse effects identified under Stipulation VII.D.2 above.
- E. Should the Forest Service through the process set forth in Stipulation VII.D. above identify steps that can be taken without adversely affecting the objectives or efficiency of the proposed activity, to reduce to an acceptable level any adverse effects identified under Stipulation VII.D.2 above, the Forest Service will undertake such steps.
- F. Where adverse effects will occur that cannot be reduced to an acceptable level without adversely affecting the objectives or efficiency of the proposed activity, the Forest Service will ensure that data recovery is undertaken to mitigate such impacts, and will ensure that such data recovery addresses the study items set forth in Stipulation VII.C. to the extent possible.
- G. The results of data recovery and other studies will be applied to the development of the management strategy required pursuant to this agreement.
- H. Impacts on any property that is not a lithic-dominated site as defined in Stipulation VII.A will be considered in consultation with the Oregon SHPO in accordance with 36 CFR Part 800.

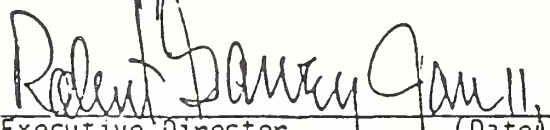
VIII. Distribution

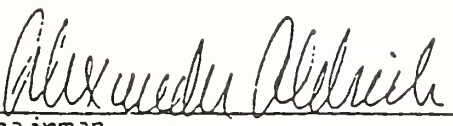
The Forest Service will distribute copies of this PMOA and all documents cited in it and its attachments as well as any appropriate intra-Forest Service materials to each appropriate division of the Regional Office, to each affected Forest Supervisor or dissemination to appropriate staff, and to each District Ranger in affected forests.



U.S. Forest Service (Date)


Oregon State Historic Preservation Officer 10.19.83,
(Date)


Executive Director 11, 1984
(Date)
Advisory Council on Historic
Preservation


Chairman 1/16/84
(Date)
Advisory Council on Historic
Preservation

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ATTACHMENT A
OVERVIEW GUIDELINES

A. An overview study has the following purposes:

1. To set forth what is known about the history and prehistory of an area. Areas to be studied for the purposes of information gathering will be those with environments and cultural contents similar to those of the Forest with the understanding that these areas will be larger than the Forest;
2. To describe and evaluate the quality of historical, archeological, and other surveys and studies in the area, upon which knowledge of the area's history, prehistory, and history properties is based;
3. To identify organizations, professions, local governments, social or ethnic groups, and others with interests in/or concerns about historic properties in the area;
4. To set forth appropriate methods, where needed, for obtaining the views of/and consulting with such groups;
5. To describe the locations of known historic properties, including those in/or determined eligible for the National Register of Historic Places and those recorded in state and local inventories, publications, and other data sources, that might be eligible for the National Register;
6. To identify subareas within the area, where historic, ethnographic, geographic, geological, environmental, remote sensing, or other pertinent data indicate that undiscovered historic properties are likely to exist;
7. To predict the types of historic properties that are likely to exist and to classify known historic properties and properties thought likely to exist, into types based on their potential value for archeological or other research, their potential or known sociocultural value, their potential for public interpretation, and their potential for continuing use or adaptive reuse. The classification must include a rationale for judgments about each property type, taking into account the National Register's "Criteria for Evaluation" (36 CFR 50.6) and other relevant sources;

8. To predict (or extrapolate) the location of property types in areas potentially affected by projects and to propose appropriate methods of completing location of predicted types of properties taking into account the nature of the predicted types and the conditions of the ground surface;
 9. To assess the significance of known historic properties and predicted types of historic properties, using the National Register's "Criteria for Evaluation" (36 CFR 60.6), pertinent State Historic Preservation Plans, and relevant professional literature to provide general guidelines; and,
 10. To propose appropriate methods for the management or treatment of such properties and predicted types of properties.
- B. An overview study is conducted in accordance with the techniques and methods generally expected by the historic preservation professions and pertinent to the area under study, by/or under the supervision of a qualified professional meeting one or more of the qualification standards set forth in Appendix C, 36 CFR Part 66 (draft) Federal Register, January 28, 1977.
- C. An overview study is based on a thorough review of pertinent historical ethnographic, sociological, geographic, geological, and other sources, as well as relevant state, regional, and local plans and inventories and the National Register of Historic Places.

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ATTACHMENT B
STRATEGY STANDARDS

I. Prerequisite Standard

- A. All preservation work proposed must be justifiable by the nature of the properties involved. For example, areas proposed for survey, and proposed survey methodology, must be based upon the predicted or extrapolated locations of properties and the surface condition of the area. Similarly, all proposed treatments must be based upon the expected value of historic properties or property types. Surveys must test the predictive models through sampling of all zones, including areas where sites are not predicted.
- B. It is understood that a strategy may not anticipate all types of properties and may not anticipate all values of property types. Some flexibility must be maintained in the strategy to respond to unexpected property types or values.
- C. All reports of work accomplished will meet, in content and form, the standards generally expected by historic preservation professionals and generally set forth in 36 CFR Part 66 (draft).

II. Area Encompassed

- A. The management strategy for the seven affected forests developed shall be applicable overall to the seven affected National Forests.
- B. For Specific Timber Management Projects
 - 1. Potential impact area. Within the area of potential impact, all known properties will be precisely located (UTM coordinates) and areas where historic properties are likely will be generally located so that they can figure in selection of the project area.
 - 2. Actual impact area. Within the actual impact area, on-the-ground survey will be conducted in areas where historic properties are likely to determine the presence or absence of such properties.

III. Classification and Prediction

- A. Classification. The strategy will rely upon the classification of types of history properties developed in the overview study.

- B. Prediction. The strategy will rely upon the prediction of historic property types and their anticipated location developed in the overview study.

IV. Implementation Elements

- A. Inventory. The strategy will provide for consultation with the Oregon SHPO to develop a Forest Inventory Plan to identify those portions of an impacted area inquiring further study in order to identify archeological properties, with the understanding that:
1. those portions of the project area will be studied that are shown by the overview and subsequent field study to be likely to contain historic properties. (Conversely, those areas that are not likely to contain properties should be studied to a lesser extent);
 2. the method of identification will be responsive to surface conditions (e.g., in areas where the surface is obscured, identification may include test pits in likely areas; where surface is not obscured, identification may be limited to field inspection); and,
 3. for areas where insufficient information exists to determine where historic properties are likely, the strategy will provide a mechanism to obtain information and then to develop operating strategies, with the understanding that on-the-ground sampling survey may be used.
- B. Property treatment. The strategy will establish appropriate forms of treatment for archeological properties with the understanding that treatment will be based upon the potential value of each type and the level of knowledge about each type, and potential effects of various activities on each type.

Treatment will be based on (a) consultation with the Oregon SHPO, (b) the desirability of preserving archeological properties in place if feasible, and (c) the utility of such sites for addressing significant and humanistic research questions. In addition, the treatment will take into account the numbers of each type affected (e.g., if large numbers are to be affected, it may be appropriate to treat only a sample; conversely, if few are affected, it may be appropriate to treat all), and the extent of effect upon a particular property (e.g., the treatment should respond to whether all or simply one portion of a property will be affected).

For properties of cultural or religious value to American Indians or other social groups, data recovery will not be conducted until consultation has been completed with the affected group to reach agreement as to provisions for protecting religious values.

Standard forms of treatment for historic properties may include; but need not be limited to:

1. avoidance of the archeological property;
 2. archeological data recovery;
 3. in-depth consultation with groups having social, religious, or cultural concerns with a property, to establish mitigation measures; and
 4. monitoring during timber harvesting.
- C. Flexibility. It is understood that the forms of treatment proposed will be viewed as guidelines and that, depending upon the characteristics of a specific site, the treatment may be more or less comprehensive than proposed.
- D. Unanticipated property types or property values. The strategy will establish a mechanism for responding to properties that are not anticipated by the overview, or unexpected values in property types.
- E. Properties discovered during construction or timber harvest. The strategy will establish a mechanism for determining the appropriate treatment of properties discovered during construction or harvest, following generally the guidance set forth in accordance with B above and providing for consultation with the authorized officer to determine treatment.
- F. Monitoring. The strategy will provide for development of reports to ensure the management strategy is implemented and is working.
- G. Feedback mechanism. The strategy will provide for a mechanism to modify strategies as a result of information provided by field work.
- H. The strategy will address the curation of archeological material recovered during inventory and data recovery.
- I. The strategy will provide for appropriate management, storage, and dissemination of reports and other primary and secondary data, taking into account the standards of 36 CFR Part 66 (draft).

- J. The strategy will establish minimum qualifications for supervisory archeologists overseeing implementation of the PMOA using the qualification standards set forth in Appedix C, 36 CFR Part 66 (draft) Federal Register, January 28, 1977.
- K. The strategy must include consideration of at least the following U.S. Government guidelines:
 - 1. "Guidelines for Local Surveys: A Basis for Preservation Planning" (HCRS 1978).
 - 2. "The Archeological Survey: Methods and Uses" (HCRS 1978).
 - 3. "The Resource Protection Planning Process" (HCRS 1980).
 - 4. "Treatment of Archeological Properties" (ACHP 1980).

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17.0 APPENDIX 6:

Forest Service Site Form

Cultural Resource Site Report
 Forest Service Number _____ Region 6-USDA-Forest Service Permanent Number _____

Forest: _____ Ranger District: _____ County: _____
 Site Name (if any): _____

LOCATION DATA: TRI Compartment: Name: _____ Number: _____
 Legal Description: _____ 1/ _____ 1/ _____ 1/ _____ 1/ , sec. _____, T. _____ R. _____, M. _____
 _____ 1/ _____ 1/ _____ 1/ _____ 1/ , sec. _____, T. _____ R. _____, M. _____
 Aerial Photo: Number _____ Flight _____ Date _____
 UTM: Zone _____ Easting _____ Northing _____
 U.S.G.S. Quad.: Name _____ Series _____ Date _____
 Elevation: Feet: _____ to _____. Meters: _____ to _____.
 Describe access to the site and site datum: _____

SETTING:

Terrain: General Topography: _____ Slope _____ %
 Land Form: _____ Aspect _____
Soils: Surface: _____ Depth: _____
 Subsurface: _____ Depth: _____
 Bedrock: _____

Flora: On-site _____ Surrounding Site _____
 Overstory _____ : _____
 Understory _____ : _____
 Ground Cover _____ : _____

Water Sources:

Name	Type	Distance	Direction	Drainage Basin
:	:	:	:	:
:	:	:	:	:

Relation to major drainage: _____

Other Environmental Features: _____

Site Dimensions: _____ Acres _____ Depth: _____
 Date(s) of Use (as specific as possible): _____
 How Date Determined: _____
 Site Type/Function/Use: _____
 How Determined: _____

Physical Data: _____

Cultural Resource Site Report
 Forest Service Number Region 6 U.S.F.S. Permanent Number

Physical Data/Other Data Continued:

Present Condition of Site:

Expected Impacts/Present Use:

Short-term:

Long-term:

Continuation Sheet No.(s)

Maps-pg(s)._____

Photographs-pg(s)._____

Features-pg(s)._____

Artifact Drawings-pg(s)._____

Test Pit(s)-pg(s)._____

Aerial Photos-pg(s)._____

Other:_____pg(s)._____

_____pg(s)._____

References Cited:

Material Collected: Yes___ No___

Present Location of Collection:_____

Date(s) Collected:_____

Description of Collected Material:

Inventory Report Title:_____

Author:_____Date:_____

Name of Recorder:_____Date:_____

NRHP Eligibility Determination: Eligible_____ Not Eligible_____

Date Formal Determination Completed:_____

Approved:_____:

Name of Professional Reviewer

Title

18.0 APPENDIX 7:

**Draft Update
Forest Service Manual
Chapter 2360, Cultural Resource Management**

2360.4 - RESPONSIBILITY

2360.47 - Cultural Resource Technician. Under the direct guidance of a professional cultural resource specialist, a cultural resource technician may:

1. Seek out and compile documentary and other information for the preparation of overviews and assist a professional in evaluating existing cultural resources information.
2. Perform a survey sufficient to identify and record all locatable cultural resources within the area of examination.
3. Prepare a report for the review of a cultural resource specialist.
4. Complete formal cultural resource management training course and demonstrate the ability to apply this knowledge by completing one acceptable survey project every year after training.

The cultural resource technician may not make evaluations including determinations of significance and effect. These must be made by a professional cultural resource specialist.

2362 - STAFFING AND TRAINING

2362.3 - Cultural resource technicians. Ensure that all cultural resource technicians satisfactorily complete specialized training in cultural resource management.

2362.31 - Qualification. Cultural resource technicians are qualified by successful completion of a formal cultural resource management training course. The Regional Forester issues a notification of qualification upon the recommendation of the Forest Supervisor and with the concurrence of the Regional Preservation Officer.

2362.32 - Retention of Qualification. To retain qualification for a period of two years, a cultural resource technician must stay current with developments in the cultural resource management field and must demonstrate the ability to apply this knowledge by completing at least one acceptable survey project every year after training. The Regional Forester may revoke or suspend qualification in the event the cultural resource technician does not perform adequately. Following the suspension of qualifications, an individual must successfully retake some or all of the training courses as recommended by the Regional Preservation Officer and demonstrate the ability to perform adequately in order to requalify.

Each cultural resource technician must be requalified every two years in order to continue to perform cultural resource duties. Requalification will be announced in writing by Forest Supervisors upon the recommendation of the Regional Preservation Officer.

2362.33 - Training. The minimum training course for cultural resource technicians shall consist of a Regionally approved 40-hour course.

